

Historical Vadose Zone Contamination from T, TX and TY Tank Farm Operations

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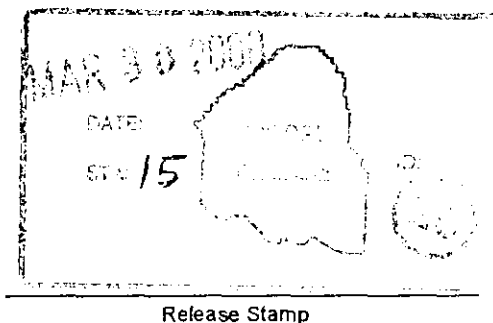
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Abstract: This report compiles information on liquid waste discharged to the soil vadose zone within a 225-acre area around T, TX and TY Tank Farms. Planned discharges (i.e., transfers to cribs) and unplanned releases (spills or tank leaks) are considered. Discharges are presented chronologically and placed in the context of tank farm operations. Analytical results of crib discharges are presented when available.

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HISTORICAL VADOSE ZONE CONTAMINATION FROM T, TX, AND TY TANK FARM OPERATIONS

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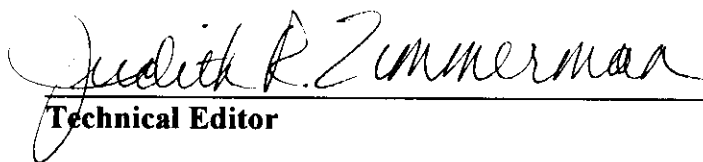
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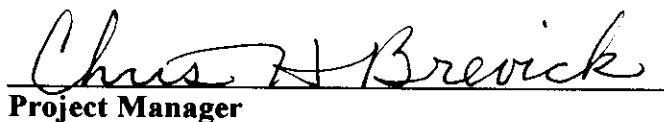
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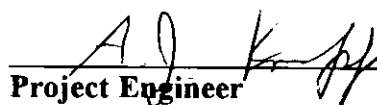
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ABBREVIATIONS/ACRONYMS

AEC	Atomic Energy Commission
DCRT	Double-contained receiver tank
GE	General Electric Company
HEW	Hanford Engineer Works
HI	Health Instruments
IMUST	Inactive miscellaneous underground storage tank
ITS	In-tank solidification
MW	Metal waste
PFP	Plutonium Finishing Plant
PNNL	Pacific Northwest National Laboratory (Battelle)
SST	Single-shell tank
TBP	Tri-butyl phosphate
UPR	Unplanned release
UR	Uranium recovery
WIDS	Waste Information Data System
1C	First-cycle waste
2C	Second-cycle waste
224	Plutonium concentrator waste
5-6	T Plant cell drainage waste

GLOSSARY

Crib: An underground liquid waste disposal site filled with soil and/or crushed gravel utilizing the ion exchange properties to remove radioactive contamination. Typically, cribs were operated until contamination was observed in the groundwater beneath the crib.

Double-Contained Receiver Tank (DCRT): A reinforced concrete structure containing a receiver tank for radioactive liquid waste, a pump pit, and a filter pit.

French Drain: A buried horizontal pipe filled with rock, open-ended or perforated, for disposal of liquid waste by seepage into the ground.

Interim Isolation: The process of establishing at least one physical barrier to any credible source of liquid addition to a single-shell tank or other facility, such as a diversion box, and separating the tank atmosphere from the outside air by a filtered ventilation system.

Interim Stabilization: The process of pumping all supernatant waste and as much drainable interstitial liquid as possible from a single-shell tank (SST), typically using a saltwell pump, to minimize the volume of liquid available to leak into the ground.

Reverse Well: A buried vertical pipe with the lower end open or perforated to allow seepage of liquid waste into the ground. Also called *dry well*.

Specific Retention Trench: An unlined excavation used for the disposal of a designated volume of low-level or intermediate-level radioactive waste. Liquid is retained in the trench soil and does not migrate to the groundwater.

Supernate: The supernatant liquid in a tank when all suspended solids have settled.

Vadose Zone: The portion of the soil below the surface but above the groundwater.

HISTORICAL VADOSE ZONE CONTAMINATION FROM T, TX, AND TY TANK FARM OPERATIONS

1.0 INTRODUCTION

This document is a collection of historical information regarding radioactive contamination of the soil surface and vadose zone in the vicinity of the 241-T, 241-TX, and 241-TY tank farms. Specifically, the historical information is compiled for the tank farms, all known liquid radioactive waste disposal sites (cribs), and all known unplanned releases (UPRs) in the vicinity. The area of interest is approximately 900 000 m² (225 acre), extending from 19th Street north to the T trenches, and from the TX trenches to the 241-TX-155 diversion box (see figure 1, all figures are shown in Appendix L). Although not directly associated with tank farm operations, nearby cribs associated with the 231-Z Facility are included in this report because of their potential impact on the vadose zone. Releases are included from initial construction in 1944 to the present. A list of disposal sites is contained in Appendix A, and a list of UPRs is included in Appendix B.

Two sites have been remediated and are not included in this report. Site 216-T-13 was the decontamination solution disposal pit for the old 269-W regulated garage. Contaminated soil was removed in 1972 and the site was released from radiological controls. Site 216-T-31 was a French drain for Site steam condensate that was contaminated during an attempt to unplug a waste line in 1959. Contaminated soil was removed in 1962 and the site was released from radiological controls (reference WIDS).

Excluded from this report are nonradioactive wastes such as fuel spills, septic tanks, and buried radioactive solid waste. Water discharges to the soil, either from precipitation, waterline leaks, or decontamination activities are addressed in Gaddis (1999).

The timeline of events is included in Appendix C.

The primary focus of this report is on cribs rather than spills. Crib disposal outlets are typically located 3 to 10 m (9 to 30 ft) below grade, while most spills occur at ground level and contaminate only the surface. Many spill sites were quickly cleaned up and decontaminated. Additionally, the sitewide volume of waste discharged to the cribs is more than 100 times the volume of waste leaked from tanks (Consort 1994).

The 216-T-3 reverse well and the 216-T-6 crib are located east of 241-T farm. Although slightly outside the area of interest, these facilities are included in this report because of their close association with tank farm operations and their potential impact on the vadose zone. Trench 216-T-5, crib 216-T-7, and crib 216-T-32 are located just to the west of T farm; and crib 216-T-36 is southwest of T farm. Crib 216-T-19 is just to the south of TX farm. The T trenches (216-T-14 through 217-T-17) are northeast of T farm. The TX trenches (216-T-21 through 216-T-25) are to the west of TX farm. To the east of TY farm are the three TY cribs (216-T-26 through 216-T-28) and the 216-T-18 test crib. A fourth TY crib apparently was built but never used.

The groundwater beneath the T/TX/TY tank farm complex is 74 m underground and the regional gradient is from west to east. Generally, groundwater in the 200-West (200W) Area moves to the east, but there is a flow to the south/southwest under TX farm and the 216-T-19 crib due to groundwater contours. The groundwater level beneath 200W Area has been decreasing since crib and pond discharges were discontinued and represents the Hanford Site's greatest decline in groundwater elevation from 1979 to 1995. The groundwater mounds under the cribs are still decreasing, and additional groundwater level declines are occurring from the use of pump-and-treat injection wells (Hartman 1999).

2.0 SUMMARY AND CONCLUSIONS

A number of significant discharges of radioactive contamination to the surface soil and vadose zone occurred throughout the operating history of the Hanford Site. The most significant discharges to the area of interest around the T/TX/TY tank farm complex are summarized as follows:

- The largest discharge (431 million liters) was to crib 216-T-19. This crib received 242-T evaporator condensate from the various waste evaporation campaigns.
- 110 million liters of a combination of second cycle (2C), T Plant cell drainage waste (5-6), and plutonium concentrator waste (224) was discharged to crib 216-T-7.
- Four cribs at 231-Z received very high discharges. Crib 216-Z-16 received 102 million liters, 216-Z-7 received 48 million liters, 216-Z-17 received 37 million liters, and 216-Z-5 received 31 million liters. Crib 216-Z-7 may have received 80 million liters (see below). The waste discharged to these cribs was 231-Z process waste, but 216-Z-7 also received some waste from the 340 Building.
- Crib 216-T-6 received 45 million liters of 5-6 waste. Crib 216-T-32 received 29 million liters of 224 waste. The 216-T-3 reverse well received 11 million liters of a combination of 224 and 5-6 waste.
- Other significant discharges were to the TY cribs: 42 million liters of T Plant decontamination waste and 300 Area laboratory waste to crib 216-T-28, 12 million liters of scavenged 1C to 216-T-26, and 7 million liters of 300 Area laboratory waste to crib 216-T-27.
- Eleven million liters of first-cycle waste (1C) were discharged to the T and TX trenches (216-T-14 through 216-T-17 and 216-T-21 through 216-T-25).
- The largest leak of high-level waste occurred in 1973, when 435 000 liters escaped from Tank 241-T-106.

The available information is generally consistent regarding dates, volumes, and waste types of spills and crib discharges. Small discrepancies are noted in this report. The only large discrepancy involves the volume of waste discharged to trench 216-Z-7 (see Appendix I).

There are other cribs in 200W Area outside the scope of this report but mentioned here for comparison. Trenches 216-T-34 and 216-T-35 received 23 million liters of liquid waste from

300 Area. Crib 216-T-33 received 2 million liters of decontamination waste from T Plant. Crib 216-S-20 received 135 million liters of liquid waste from 222-S Laboratory and the 300 Area. Cribs 216-U-8 and 216-U-12 received a total of 513 million liters of tri-butyl phosphate (TBP) plant condensate from U Plant (Maxfield 1979).

This report supports previous work on discharges to the cribs associated with the B/BX/BY tank farm complex (Williams 1999). Studies similar to these could be made for the other separation plants and tank farms. Upon completion, these studies can be integrated into a single report. This approach is necessary to account for waste streams that affect more than one plant or tank farm complex. For example, the uranium recovery mission affected U Plant, U farm, B/BX/BY tank farms, C farm, and T/TX/TY tank farms.

3.0 FACILITIES HISTORICAL BACKGROUND

The 241-T tank farm contains 12 first-generation, reinforced concrete tanks with carbon steel liners covering the sides and bottoms. The tanks are 23 m (75 ft) in diameter and 4.9 m (16 ft) deep, with a capacity of 2 million liters (530,000 gallons). The tanks are arranged in four rows of three tanks. The tanks in each row are piped together so that when the first tank fills, it overflows (cascades) into the second tank, and the second into the third. Five diversion boxes and a booster pump pit are provided in T farm. The farm also contains four smaller "200-series" tanks that are 6.1 m (20 ft) in diameter and hold 0.2 million liters (55,000 gallons). These four tanks are piped to diversion box 241-T-252 and to crib 216-T-32. (See figure 1.)

The 241-TX tank farm contains 18 second-generation tanks similar to T farm tanks, but with a 2.9-million liter (758,000-gallon) capacity. The tanks are arranged in three, 4-tank cascades and two, 3-tank cascades. TX farm has four diversion boxes and the 244-TXR process vault. There are no 200-series tanks in TX farm. (See figure 1.)

The 241-TY tank farm contains 6 tanks of identical design to the tanks in 241-TX farm, arranged in three, 2-tank cascades. TY tank farm contains one diversion box, the 244-TX double-contained receiver tank (DCRT), and no 200-series tanks. (See figure 1.)

Other facilities are contained in and around the T/TX/TY tank farm complex. The 207-T retention basin and the 216-T-12 pit are east of T farm. The 242-T Evaporator Facility includes the evaporator building and control room between the TX and TY farms, and the 242-T-151 diversion box and 242-TA receiver vault inside TX farm. Piping for saltwell pumping is located throughout the T/TX/TY complex. The 241-TX-155 diversion box and 216-T-20 pit are to the east of TX farm. The 231-Z Facility, southwest of the tank farm complex, includes the isolation building, 231-W-151 sump tank vault, and seven cribs. (See figure 1.)

The T/TX/TY complex operations can be separated into six distinct operational phases:

- From 1943 to 1945, T farm received liquid waste from the Manhattan Project bismuth phosphate plutonium separation operations in T Plant. (See figure 2.)
- From 1946 until T Plant shutdown in 1956, the tank farms were expanded and received liquid waste from the bismuth phosphate operations. Liquid waste disposal to the soil column was initiated. (See figure 3.)

- From 1952 to 1958, high-level waste from the tank farms was sent to U Plant for uranium recovery (UR) and fission product scavenging. Scavenged waste was discharged to the cribs. Low-level process condensate was also discharged to the cribs. (See figure 4.)
- Since 1958, T Plant has served as the central decontamination facility for the Hanford Site. Decontamination waste was discharged to the cribs until January 1969. Liquid waste from the 300 Area was also discharged to the cribs around T, TX, and TY farms during this time.
- In-tank solidification (ITS) operations occurred from 1965 to 1974, using the 242-T Evaporator Facility. Condensate was discharged to the cribs. (See figure 5.)
- Tank farm interim stabilization (saltwell pumping) and isolation began in 1975. The 242-T evaporator and the 231-Z Facility were shut down during this period. (See Figure 6.)

Sanitary water was not supplied to the T/TX/TY tank farms during wartime bismuth phosphate operations, but was supplied to the 231-W Isolation Building. During the 1950s, sanitary water was supplied to the 242 T evaporator and the 271-TXR control house. All sanitary water piping to the tank farms is believed to be capped off and abandoned.

3.1 Wartime Bismuth Phosphate Operations, 1943-1945

The 241-T tank farm was constructed in 1943-1944 as part of the Manhattan Project Hanford Engineer Works (HEW) to provide storage for the radioactive liquid waste produced at T Plant. Figure 2 shows the facilities constructed at this time. T Plant used the bismuth phosphate process to separate plutonium from irradiated fuel slugs.

The bismuth phosphate process produced five waste streams:

- Metal waste (MW) was the byproduct from the plutonium separation phase of the bismuth phosphate process. MW contained unfissioned uranium and approximately 90% of the fission products of the irradiated fuel.
- First-cycle waste (1C) was the byproduct from the first plutonium decontamination cycle of the bismuth phosphate process. This waste contained about 10% of the fission products of the irradiated fuel. This waste stream also contained coating-removal waste.
- Second-cycle waste (2C) was the byproduct from the second and last plutonium decontamination cycle of the bismuth phosphate process. This waste contained less than 0.1% of the fission products of the irradiated fuel.
- The 224 waste was low-level liquid waste from the 224-T Plutonium Concentrator Building. This waste stream was the primary contributor to plutonium contamination of the soil. This waste was routed to the 241-T-361 settling tank, and then discharged to the 216-T-3 reverse well near T Plant. It was later routed to the 200-series tanks for settling and discharged to crib 216-T-32.
- The 5-6 waste was low-level liquid waste from floor drains in individual process cells in T Plant. This waste was discharged to the 216-T-4 pond during the T Plant startup

testing “cold run,” but was routed to the 5-6 tank in T Plant when processing of irradiated fuel began in December 1944. Waste stored in the 5-6 tank was discharged along with 224 waste to the 241-T-361 tank and the 216-T-3 reverse well.

MW, 1C, and 2C were stored in tanks at T farm. These waste streams were also sent to the 241-U tank farm, which is outside the scope of this study (Parker 1944).

From the 224-T Concentrator Building, the plutonium solution was transported by truck to the 231-W Isolation Building (later called 231-Z), where final preparation of the plutonium nitrate paste was conducted. So-called “clean” waste such as cooling water, steam condensate, and floor drainage went to the 216-U-10 pond via the 216-Z-1 ditch. Process waste was neutralized in the 231-W-151 sump tank and discharged to the 216-Z-10 reverse well. The well plugged on May 6, 1945, and waste was rerouted to the 216-Z-6 temporary crib until the 216-Z-5 double crib was finished on May 31, 1945.

Little documentation is available for pit 216-Z-4, which was also used as a temporary disposal site. Reports from May 1945 describe “temporary” facilities in use within 24 hours, and a “covered” disposal basin (apparently 216-Z-6) in use by May 10, 1945. It is considered most likely that pit 216-Z-4 was dug immediately, but was not large enough to accommodate the waste inflow and may have overflowed. It was used for a day or so until 216-Z-6 was constructed (Acken 1945a; Acken 1945b; DuPont 1945; Owens 1981). The hurried construction and lack of documentation is consistent with HEW priorities of the time: the German surrender occurred during this period, and Los Alamos did not yet have enough plutonium to assemble the Trinity and Nagasaki atomic bombs.

Ground disposal of aqueous industrial waste, relying on the ion-exchange properties of the soil to decontaminate the water as it percolates to the aquifer, was a commonly accepted method in the 1940s. The ability of Hanford Site topsoil and substrate to adsorb radioactive material was tested at the Clinton site in Tennessee (later Oak Ridge National Laboratory) and at the University of California at Berkeley in 1944. Tests determined that ground disposal of 5-6 and 224 was acceptable, but ground disposal of 1C and 2C was not. Methods to treat 1C and 2C to facilitate ground disposal were investigated at the time, but were unsuccessful (Parker 1944; Patterson 1945; Leader 1945).

3.2 Postwar Bismuth Phosphate Operations, 1946-1956

In September 1946, the Army Corps of Engineers Manhattan District selected General Electric Company (GE) to replace DuPont as the Site prime contractor. Pursuant to the McMahon Atomic Energy Act of 1946, control of the Hanford Site passed from the Army to the civilian Atomic Energy Commission (AEC) on January 1, 1947. The AEC opted to maintain Hanford as a permanent facility rather than dismantle it, as happened to many other wartime munitions plants. Wartime production had filled all available waste tank storage space, so plans were made to increase high-level waste storage capacity and to recover some tank space. These plans included disposing of the relatively low-level 2C waste into the ground and concentrating the intermediate-level 1C waste in an evaporator. Plans were also made to recover the unfissioned uranium in the MW (by 1947, most of the world’s known supply of uranium was in Hanford waste tanks).

From 1947 to 1949, many new facilities were constructed at Hanford. The TX tank farm, facilities for the planned uranium recovery mission (see section 3.3), and other facilities beyond the scope of this report (BX/BY tank farms, Z Plant, H Reactor, DR Reactor, Hot Semi-Works) were all built during this period (Gerber 1991). The 241-TX-155 diversion box was a central waste distribution facility, capable of routing waste between T Plant, U Plant, T/TX tank farms, and U tank farm. When TY farm was constructed in 1952, it was also connected to the 241-TX-155 diversion box. Figure 3 shows facilities constructed for postwar bismuth phosphate and waste disposal operations.

Disposal of 224 in a reverse well was quickly recognized as a "definite mistake" because of the potential for groundwater contamination, and the 216-T-3 reverse well was replaced by the 216-T-6 double crib in August 1946. An additional problem was that the 241-T-361 settling tank had filled with very hard sludge, making it unusable as a settling tank. Consequently, the 5-6 waste line was modified in October 1946 to bypass 241-T-361, and 5-6 waste was discharged directly to the 216-T-6 cribs without settling. This was considered unsatisfactory, but necessary. At the same time, the 224 waste line was rerouted to the 200-series tanks in T farm for settling and overflow to the 216-T-32 double crib. The 224 waste discharged to the tanks was sampled for plutonium (Pu) and fission product content, but the final overflow to the crib was not routinely sampled. Occasional checks indicated that "virtually all" radioactivity was retained in the 200 series tanks. The waste discharged to the 216-T-3 reverse well, the 216-T-6 cribs, and the 216-T-32 cribs is summarized below (USAEC 1946; GE 1946; Brown 1948; Keene 1951; Anderson 1976).

Table 1
224 and 5-6 WASTE DISCHARGES

Crib	216-T-3	216-T-6	216-T-32
Dates of Operation	1944-1946	1946-1951	1946-1952
Waste type	224, 5-6	5-6	224
Total waste (L)	1.13E+07	4.50E+07	2.90E+07
Pu (g)	3350	3900	3200
U (kg)	N/A	22.7	22.7
β emitters (Ci)	2380	18 000	1500
^{90}Sr (Ci)	557	360	30
^{106}Ru (Ci)	1280	600	50
^{137}Cs (Ci)	595	300	25
^{60}Co (Ci)	N/A	50	1

Note: Curies are uncorrected for decay.

In February 1947, sludge buildup sealed the bottom of the 216-Z-5 cribs, and the 231-Z Building waste was rerouted to trench 216-Z-7. Construction of the Plutonium Finishing Plant (PFP) in

1949 required replacing part of the 216-Z-1 ditch – from 231-Z to the PFP – with an underground pipeline (Brown 1948; Patterson 1949; Owens 1981).

Ground disposal of waste had always been regarded as an expedient, temporary disposal method, and treatment of 224, 5-6, and other waste types by such means as evaporation, scavenging, or ion exchange were investigated. Experiments with 2C revealed that most activity was concentrated in the sludge settling at the tank bottom, leaving a low-activity supernatant liquid that met existing criteria for ground disposal. The continuing shortage of waste tank space led to the decision to send 2C waste to a crib after cascading and settling (Piper 1949; Burns 1949; Brown 1950).

Crib 216-T-7 and its tile field were constructed in 1947 in T farm to dispose of 2C waste. Initially, the crib was piped to a riser between 241-T-110 and 241-T-111 in T farm, accessible via an overground line, and waste was discharged one month per year. From September 1949 to December 1950, the average activity of 2C discharged to the crib was 3.8 $\mu\text{g/L}$ of Pu and 16 $\mu\text{Ci/L}$ of beta emitters. In May 1951, the crib line was piped directly to tank 241-T-112 (the final tank in the cascade series used for 2C storage), and the cascade continuously overflowed to the crib (GE 1947; Keene 1951; GE 1951b).

Research in 1950 determined that combining 5-6 waste with 2C and again allowing it to settle before discharge to a crib was a safer disposal method than direct discharge to crib 216-T-6. In June 1951, 5-6 waste was sent to the 241-T-110/111/112 cascade along with 2C waste, allowed to settle, and overflowed to crib 216-T-7. The average activity of the combined waste stream discharged to the crib was 2.4 $\mu\text{g/L}$ of Pu and 43 $\mu\text{Ci/L}$ of beta emitters. In June 1952, 224 was also diverted to this cascade when the 200-series tanks filled with sludge and were no longer usable for settling. The average activity of this waste stream was 1.06 $\mu\text{g/L}$ of Pu and 27.2 $\mu\text{Ci/L}$ of beta emitters. Crib 216-T-7 reached its radionuclide limit in December 1955. The crib was isolated and the waste rerouted to crib 216-T-19 (see below). Analytical data for discharges to crib 216-T-7 are in Appendix D (GE 1950a; Ruppert 1952; Ruppert 1954; Heid 1956).

One processing run in early 1955 resulted in an unusually high level of activity in the 2C waste. Even after cascading and settling, the activity was still too high (66 $\mu\text{g/L}$ of Pu and 47 $\mu\text{Ci/L}$ of beta emitters) to crib. Approximately half of the batch (2.65 million liters) was sent to specific retention trench 216-T-5 in May; the remainder stayed in 241-T-112 (Paas 1955).

The 242-T evaporator was built in 1951 to reduce the volume of 1C waste. Operations began late April 1951. The evaporator received 1C waste from feed Tank 241-TX-118. Evaporator condensate was sent to crib 216-T-19 and its tile field via the 242-T-151 and 241-TX-153 diversion boxes. This condensate had an average plutonium concentration of 0.049 $\mu\text{g/L}$ and an average beta emitter concentration of 0.044 $\mu\text{Ci/L}$. Analytical data for discharges to crib 216-T-19 are in Appendix E. Cooling water was sent to the 241-T-4 pond via the 207-T retention basin. Evaporator bottoms were sent to Tanks 241-TX-113, -116, and -117. This waste was then re-evaporated in a second pass. From startup in 1951 to shutdown in 1954, the 242-T evaporator reclaimed 34.7 million liters (9 million gallons) of tank space in T farm, TX farm, and the newly constructed TY farm (GE 1951c; Ruppert 1952; Anderson 1990).

When the 242-T evaporator was needed for TBP waste (see next section), ground disposal of 1C was pursued. In May 1953, direct disposal of 1C to specific retention trenches was approved, at a maximum discharge rate of 5,280 L/m² (150 gal/ft²) to ensure retention of waste in the soil. Evaporation of 1C was discontinued in June 1953. Approximately 17 million liters of 1C in 200E and 200W Areas had not been evaporated at that time. From January to June 1954, 2.9 million liters of 1C were sent to the T trenches via an overground line from 241-T-106. From June to August 1954, 5 million liters of 1C were sent to the TX trenches via an overground line from 241-TX-110. Trench disposal of evaporator bottoms was approved in June 1954, and 3 million liters were discharged to 216-T-25 in September (Healy 1953; Carpenter 1953; Ruppert 1954; Anderson 1990). Details of 1C discharges to the T and TX trenches, including analytical data, are provided in Appendix F.

Evaporation of TBP waste was discontinued in September 1954, following the development of the ferrocyanide scavenging process. As described in the following section, the scavenging process removed the principal long-lived fission products, ¹³⁷Cs and ⁹⁰Sr, from the waste to enable ground disposal of the supernate. This process was also applied to 1C beginning in October 1954 to remove ¹³⁷Cs (⁹⁰Sr concentration in 1C already met existing limits for discharging the waste to cribs). It was necessary to segregate coating waste from 1C to accomplish this. The 242-T evaporator resumed evaporating stored 1C that had not been pumped to cribs in December 1954, and began evaporating newly generated scavenged 1C in March 1955. After 1C evaporation was finished in July 1955, scavenged 1C was stored in TY farm for settling, and supernate was discharged to crib 216-T-26 (see Appendix F). (Ludlow 1954; Anderson 1990).

Although the evaporator was shut down, discharges to crib 216-T-19 resumed in December 1955. Since crib 216-T-7 had reached its radionuclide limit, the combined 2C/5-6/224 waste stream was diverted from there to 216-T-19 via the 241-TX-155 diversion box until T Plant shutdown in August 1956 (Heid 1957).

In addition to ongoing Pu isolation work for T Plant, 231-Z received Pu solution from the Reduction Oxidation Plant (REDOX) starting in 1953, and from the Plutonium-Uranium Extraction Plant (PUREX) in 1956. (PUREX product was intended to be pure enough to bypass 231-Z and go directly to PFP, but it took a year to work the bugs out of the process.) REDOX and PUREX product streams went directly to PFP after 1956. 231-Z was converted to a plutonium metallurgy laboratory in 1957, and discharges to crib 216-Z-7 ceased (WADCP 1998).

Six UPRs are associated with bismuth phosphate operations (WIDS):

- In 1950, diversion box 241-TX-155 overflowed and 1C ran down the hillside to the west (UPR-200-W-5). WIDS has no further information on this UPR, but a review of all Health Instruments (H.I.) Division Monthly Reports for 1950 suggests that it occurred in March and involved only slightly contaminated water, which was pumped from the catch tank to crib 216-T-19 (Patterson 1950).
- Diversion box work in the spring of 1950 resulted in contamination spread to the ground around 241-T-151 and 241-T-152 (UPR-200-W-7).

- In the spring of 1951, a riser leak in the 242-T discharge line allowed “a few gallons” of 1C evaporator bottoms to spill onto the ground (UPR-200-W-12).
- In September 1952, a waste pump being transferred from 241-TX-106 to 241-TX-114 dripped contamination onto the ground, personnel, and vehicles (UPR-200-W-17).
- In October 1952, a leak in the underground line between 242-T and 207-T allowed some contaminated cooling water to leak (UPR-200-W-14).
- In March 1954, 1C escaped from a leaking underground pipe between 241-TX-105 and 241-TX-108 (UPR-200-W-100).
- In 1954, a broken transfer line between the 241-T-152 and 241-TX-153 diversion boxes caused a leak of 3,785 liters of 1C and a cave-in of soil (UPR-200-W-29). The area was backfilled and covered with gravel.

Two minor spills occurred during this time frame, but were not assigned UPR numbers. Removal of electrodes from 241-TX-105 in autumn 1951 resulted in the spread of contamination to the surrounding ground area. Construction work in spring 1952 resulted in contamination of the heel and sluice jets of 241-TX-107 (Ruppert 1953).

In December 1954, approximately 10 m³ of sludge were dredged from the 207-T retention basin and buried in pit 216-T-12. This sludge had the following composition: (Clukey 1955).

Table 2
216-T-12 BURIED SLUDGE

Isotope	Curies
Total α	9.1E-01
Total β	1.4E-03
Rare Earth	6.1E-01
Cesium	1.3E-01
Zirconium	3.3E-02
Ruthenium	6.4E-03
Strontium	4.7E-04
Plutonium	9.8E-05

Curies are uncorrected for decay

3.3 Uranium Recovery Operations (1952-1958)

U Plant was originally constructed during World War II as a bismuth phosphate plant, but was not needed for that purpose so the facility was used as a simulator. It was modified in 1951 for UR operations using the TBP process. For this reason, U Plant was frequently referred to as the

“TBP Plant.” Beginning in 1952, MW was sluiced from T and TX tank farms, treated in the 244-TXR process vault, and transferred to U Plant. MW from C, B, and U tank farms was also sent to U Plant for uranium recovery. Until T Plant was shut down in 1956, newly generated MW was also sent to U Plant for uranium recovery (Rodenhizer 1987; Anderson 1990).

The uranium recovery facilities in the T/TX/TY tank farm complex include the 271-TXR control house, the 244-TXR vault, four diversion boxes (one for T farm and three for TX farm), the 241-TR-153 booster pump pit, and modifications to the underground piping system. The TY cribs were also constructed for the uranium recovery mission, but were used for other purposes. Figure 4 shows facilities constructed for uranium recovery.

Uranium recovery operations produced two waste streams, TBP waste and low-level waste. TBP waste, concentrate from the waste concentrator, was returned to the tank farms (including the 241-T-107/108/109 cascade, 241-TX-103 and 241-TX-115 in TX farm; and 241-TY-103, 241-TY-104, 241-TY-105, and 241-TY-106 in TY farm). TBP waste was also transferred to 200E Area. The design called for the same volume of TBP waste to be produced as the volume of MW processed, but inefficiencies in the process resulted in approximately twice as much TBP waste produced as the MW processed. A total of 215 million liters of TBP waste was produced. Low-level waste included condensate from the feed concentrator, waste concentrator, and HNO₃ fractionator. This waste was discharged to various cribs that are outside the scope of this report. Cooling water and cell drainage were discharged to U pond, also outside the scope of this report (Waite 1991; DiLorenzo, et. al. 1994; GE 1951a).

Despite additional tank farm construction and ongoing volume reduction efforts, tank space was not sufficient to support both the uranium recovery mission and plutonium production. To reduce the volume of stored waste, TBP waste from T farm was concentrated in the 242-T evaporator beginning in July 1953. The condensate discharged to crib 216-T-19 had an average concentration of 0.045 µg/L of Pu and 0.086 µCi/L of beta emitters. Additionally, a ferrocyanide scavenging process was developed to remove the principal long-lived fission products, ¹³⁷Cs and ⁹⁰Sr, from the TBP waste to enable disposal of the waste supernate to the cribs. Beginning in September 1954, TBP waste was scavenged in U Plant to remove ⁹⁰Sr and ¹³⁷Cs, instead of being evaporated. Scavenged waste was sent to BY tank farm for settling, then to the BY cribs and BC cribs and trenches from 1954 to 1957. These cribs are outside the scope of this report but are described in Williams (1996). The 242-T evaporator was modified to scavenge TBP waste that was stored in the TX and TY tank farms, but was never used for this purpose and that waste was not scavenged. The 242-T control room was used for other UR operations until the program ended in January 1958. Following the end of uranium recovery operations, many tanks in the T/TX/TY tank farms received REDOX plant waste. (Ruppert 1954; Anderson 1990, Waite 1991).

Waste from a scavenging process test run in late 1953 was pumped from U Plant to Tank 241-T-101 to settle. Because of poor pH control during the test, only half of the waste could be cribbed. This waste was pumped to a test crib, later designated as 216-T-18, from December 8 through December 21, 1953. Approximately 970 000 liters of waste were discharged, containing the constituents shown below. There is a discrepancy regarding the type of waste discharged to the crib. Maxfield (1979) describes it as being scavenged 1C, but all contemporary documents (Christy 1954a; Ruppert 1954) describe it as being a test batch of scavenged TBP. Maxfield (1979) is believed to be based on incorrect information.

Table 3
216-T-18 SCAVENGED TBP TEST WASTE ANALYSIS

Constituent	Total (Ci)	Concentration (μCi/mL)
Pu	0.089	9.2E-05
U	0.054	5.6E-05
Cs	290	0.27
Sr	49	0.05
Ru	180	0.19
Sb	130	0.14
Y, rare earths	190	0.20
Total	840	0.85

Curies are uncorrected for decay.

Six incidents are associated with the 241-TX-155 diversion box, which was built in 1948 as a central transfer point between T Plant, U Plant, and the tank farms:

- Catch tank 241-TX-302B was constructed of carbon steel. In anticipation of use with acidic waste, Operations requested a stainless steel tank to replace it, but they were overruled by Engineering on cost considerations. The original tank was removed and replaced with an epoxy-painted tank designated 241-TX-302B(R) in February 1952 (GE 1952a; Koberg 1953). No UPR is associated with this incident.
- In November 1952, 1,330 liters of 50% HNO₃ was inadvertently pumped from the 241-WR vault to the 241-TX-155 diversion box, and drained to catch tank 241-TX-302B(R). The acid was subsequently neutralized and discharged to pit 216-T-20 that month (GE 1952b).
- In March 1953, a severe jumper leak filled catch tank 241-TX-302B(R). When soda ash (sodium carbonate) was added to the tank to neutralize the waste prior to pumping out the tank, a foamy solution erupted out of the riser (UPR-200-W-131). By now, the catch tank was damaged beyond repair, and it was abandoned in place and later replaced with a third catch tank, this one with the old designation of 241-TX-302B. This tank was made of stainless steel (Keene 1953; Koberg 1953; GE 1954).
- During installation of the new catch tank in April 1954, a 0.7-m (2-ft) sinkhole northwest of the diversion box was noticed. Investigation revealed that the sinkhole was caused by waste leaking from a failed jumper in the diversion box, escaping from the damaged catch tank, and flowing along the 7-66 pipe encasement (UPR-200-W-135). In the spring

of 1954, a jumper leak contaminated the area to the west of the diversion box (UPR-200-W-28) (Corley 1954; Christy 1954b). These two UPRs may be the same event.

- Another contamination event occurred in December 1954, but was not assigned a UPR number (Keene 1955).
- Some of the above areas were removed from radiation zone status in 1970. However, radioactive rabbit dung with activity as high as 100 mR/hr was found around the diversion box in 1977. This contamination was spread over a 164 m (500-ft) radius around the box (UPR-200-W-76). As soil was removed in the attempt to decontaminate the site, radioactivity increased due to subsurface contamination. The subsurface contamination was designated as UPR-200-W-113 in 1979. Several decontamination efforts have taken place, most recently in 1990. The site is posted as an "underground radioactive material" area and is surveyed annually. 241-TX-302B is the only inactive miscellaneous underground storage tank (IMUST) that is regularly monitored for liquid level (Hanlon 1999; WIDS).

3.4 Central Decontamination and In-Tank Solidification Operations (1960-1974)

Following the end of plutonium separation operations, T Plant was converted into a central decontamination facility in 1958. The 2706-T decontamination annex was built in 1959. Waste was sent to the 241-T-112 tank for settling, and supernate was discharged to the TY cribs beginning in February 1960. The TY crib inlet line was rerouted from TY farm to 241-T-112 for this purpose (see figure 5). Laboratory waste from the 340 Building in 300 Area was also discharged to crib 216-T-28 beginning in October 1963 (previously, it had been discharged to crib 216-S-20, which is outside the scope of this report). This waste was delivered by truck from the 300 Area and discharged via a riser. The 340 Building waste was diverted to crib 216-T-27 beginning in September 1965. Discovery of groundwater contamination under the TY cribs in November 1965 resulted in diverting of 340 Building waste to trench 216-Z-7. No T Plant decontamination waste was cribbed during the September-November 1965, but this waste was discharged to 216-T-28 in December 1965 and January 1966. A final discharge was made in July 1966. Details of discharges to the TY cribs, including analytical data, are included in Appendix G. T Plant decontamination waste was discharged to crib 216-T-36 from May 1967 until January 1969. Afterwards, this waste was transferred to tank farms. Trench 216-Z-7 reached its radionuclide capacity in May 1966, and 340 Building waste was discharged to trenches 216-T-34 and 216-T-35. Although trenches 216-T-34 and 216-T-35 are outside the scope of this report, analytical data for them is included in Appendix H, along with data for 216-T-36 (Bayless 1964; Gerber 1994).

Concern over the integrity of single-shell tanks (SST) (the first confirmed tank leak was in 1959) resulted in the decision to remove all liquid waste supernate from SSTs. The In-Tank Solidification (ITS) program was initiated to concentrate nonboiling waste to produce a partially mobile salt cake. In 200E area, in-tank heaters were installed in two tanks to evaporate the waste. The 242-T evaporator was modified for continuous operation and restarted in December 1965 as the ITS system for 200W Area. New piping was installed to facilitate transfers to 242-T (see figure 5). Evaporator condensate was again sent to crib 216-T-19 (Liverman 1975; Rodenhizer 1987; Williams 1999). Figure 5 shows facilities constructed for central decontamination and in-tank solidification operations.

Battelle Northwest Laboratory (now Pacific Northwest National Laboratory [PNNL]) took over 231-Z operations in January 1967, and constructed an office space addition to the south side of the building. Since trench 216-Z-7 had reached its radionuclide capacity, a new liquid waste disposal crib was needed. Waste was discharged to the 216-Z-17 temporary trench during construction of crib 216-Z-16, which began receiving waste in March 1968. The line to these cribs bypassed the 231-W-151 sump tank vault, which was isolated at this time (see figure 5). During construction, underground contamination was discovered (UPR-200-W-130). A consolidated storage and maintenance facility was constructed on the north side of the building in 1974. Crib discharges continued until the end of 231-Z operations in January 1977. Details of discharges to these cribs, including analytical data, are provided in Appendix I. Although waste-generating activities at 231-Z ended in January 1977, the building was used for other purposes until 1994 (Owens 1981; WADCP 1998).

There is some confusion regarding the discharges to 216-T-19 following the restart of 242-T. Beginning in 1968, steam condensate was reported discharged to 216-T-19, in addition to process condensate. Vacuum jet water was discharged from 1968-1970. These discharges were not reported for 1967, but the total volume was estimated and included as a footnote in the 1968 report. These discharges were not reported in 1966, and it is believed that they resulted from piping changes that occurred in 1967. The 242-T steam condensate was also reported as discharged to the 216-T-4-2 ditch (see figure 1). The discharge information in Appendix E represents the best available information. Since these discharges involve normally uncontaminated water, this discrepancy does not affect the total amount of radioactivity discharged to the crib. When these discharges are added to the evaporator condensate discharges, the total agrees to within 3% with Maxfield (1979).

Since the beginning of 1968, all tanks constructed or planned have been a double-shell design. In 1968, the AEC decided to remove all liquid waste from SSTs by 1975, using ITS. The 242-T evaporator was modified again in 1972 to concentrate Plutonium Finishing Plant (PFP) high-salt waste as well as tank farm waste. The 242-TA receiver vault was constructed next to the evaporator for this purpose, and received waste from PFP via an encased underground line (see figure 5). Since the 242-A evaporator was not yet built, 242-T also concentrated high strontium waste from 241-A tank farm, with the bottoms going to the 242-S evaporator. In 1973, the effluent line to 216-T-19 was modified to bypass the crib and discharge directly to the tile field. Disappointing performance resulted in ITS being superseded by saltwell pumping (see next section) as a method of liquid waste removal, and the ITS program was discontinued in 1974. The 242-T evaporator continued to operate until 1976, and was formally shut down in 1980 (Roal 1975; Williams 1968; Liverman 1975; Anderson 1990; WIDS).

Seven UPRs are associated with ITS operations. The broken transfer line which had caused UPR-200-W-29 in 1954 was mistakenly used again in 1966, and liquid waste surfaced and ran to the edge of Camden Avenue (UPR-200-W-97). On May 4, 1966, 2C being transferred from 241-T-107 to 242-T escaped from a ruptured transfer line and came to the surface (UPR-200-W-62). These two UPRs may be the same event. This time, the jumper was removed from 241-TX-153. While transporting the jumper to T Plant for decontamination, waste dripped from the jumper and contaminated the 23rd Street roadway (UPR-200-W-63). This area was decontaminated and removed from radiation zone status in 1972. The site was again cleaned up, but mud samples read 600 cpm in 1969 (UPR-200-W-64) and this area is now surveyed annually for radiation (WIDS).

There is a discrepancy regarding the type of waste involved in UPR-200-W-62. WIDS describes the waste as 2C being pumped from 241-T-107 to 242-T. However, Anderson (1990) reports that 241-T-107 held a combination of 1C and TBP in 1966, and 8000 gallons of this was sent to 241-TX-118 (the feed tank for 242-T). This is corroborated by the waste status summary (Roberts 1967). The original occurrence report cited in WIDS is not available. The type of waste is most likely 1C/TBP.

In September 1966, two plumes of airborne material originating from diversion box 241-TX-153 contaminated Camden Avenue (UPR-200-W-99). In January 1971, contaminated caustic sprayed from a pump pit cover in 241-TX-113 during a leak test of a new jumper assembly (UPR-200-W-129). In May 1975, a small amount of airborne contamination was released during replacement of a gasket at the 241-TX-153 diversion box (UPR-200-W-126) (WIDS).

3.5 Stabilization and Isolation, 1975-Present

Seven leaking SSTs were identified in T/TX/TY between 1959 and 1977. These leaks are identified in Appendix B. In accordance with Hanford operating policy at the time, liquid waste removal from tanks of questionable integrity was expedited and the tank was removed from service. Interstitial liquid was removed by saltwell jet pumping. The most severe tank leak was a leak of 435 000 liters from 241-T-106 in May 1973 (UPR-200-W-148). This leak released approximately 40 000 curies of ^{137}Cs , 14 000 curies of ^{90}Sr , 6 curies of plutonium, and 297 000 curies of various fission products to the soil (USAEC 1973; Liverman 1975; Anderson 1990; WIDS).

Interim stabilization is the process of removing all supernatant liquid and as much drainable liquid as possible; this process began in 1972. The T/TX/TY complex tanks were interim stabilized beginning in 1976, with the interstitial liquid pumped to receiver Tank 241-TX-107, and from there to the 242-S evaporator (the 242-T evaporator was shut down). The saltwell system for T/TX/TY farms included a pump pit for each tank, the saltwell and jet pump, piping from the pump pits to the receiver tank, and associated instrumentation and controls. See figure 6 for an illustration of the saltwell system piping arrangement (Smith 1975; Grimes 1977; Hanlon 1999).

In 1975, AEC policy was to direct all liquid waste to double-shell tanks. To discontinue the use of a SST, the saltwell waste receiver, 244-TX DCRT was constructed in 1980, tying into the existing saltwell piping. PFP high-salt waste, formerly sent to 242-TA, was also routed to 244-TX. PFP high-salt waste was not generated between 242-T shutdown in 1976 and 244-TX construction in 1980. To facilitate transfer of saltwell liquid waste, the 241-TX-152 diversion box was constructed in 1980 to replace the 241-TX-155 diversion box. The 242-S evaporator also shut down in 1980, and all waste went to 242-A for evaporation via 241-TX-152 (Mirabella 1977a; Hanson 1980).

Eight tanks in the T/TX/TY farm complex were interim stabilized prior to construction of 244-TX. Most tanks were stabilized in 1983. All tanks in the T/TX/TY complex are now interim stabilized (Hanlon 2000).

Following interim stabilization, SSTs were interim isolated by establishing at least one physical barrier between the tank contents and the environment, to preclude inadvertent addition of liquid. Cutting and blanking all process piping to and from the tank, blanking all risers and equipping the tank with a filtered ventilation system accomplished this. Eleven T farm tanks (including the 200-series tanks) are interim isolated, and five tanks are partially interim isolated. All TX and TY farm tanks are interim isolated. The 244-TXR vault, the 241-T-301, 241-TX-302A, 241-TX-302B, 241-TX-302X, 241-TY-302A, and 241-TY-302B catch tanks, and all diversion boxes (except 241-TX-152) and associated transfer lines were isolated by project B-231 in 1984-1985. The 244-TX DCRT is currently the only facility available to transfer waste out of T farm. 244-TX also receives waste from PFP and T Plant, and transfers all waste to double-shell tanks via 241-TX-152 and the 244-S DCRT (Liverman 1975; Hanlon 2000; WIDS).

Spills have not been recorded since 1977. Surface contamination from TY farm that had migrated beyond the tank farm boundaries over the years was cleaned up in 1986 and designated as UPR-200-W-167. Similar contamination around T farm was cleaned up in 1992 and designated as UPR-200-W-166.

4.0 MONITORING TEST WELLS

Monitoring test wells were drilled in each tank farm as part of original construction to check for tank leakage. To avoid groundwater contamination, these wells were drilled only to 46 m (150 ft) and did not extend to the upper aquifer (groundwater depth was 76 m [250 ft]). Wells were checked weekly. Test wells were also drilled near cribs as part of original construction to monitor vadose zone contamination. Typically, wells would be drilled to 46 m (150 ft), but major disposal sites had at least one 92 m (300 ft) well to check for nuclide migration to groundwater (Parker 1944; Brown and Ruppert 1950).

At the time of initial construction, knowledge of the groundwater hydrology of the Hanford area was limited to a few reports from the 1910s and 1920s. These reports were general in scope and limited in content. Poor information on groundwater depth in 1944 resulted in drilling for the 216-T-3 reverse well inadvertently breaking through to the aquifer. A new well was redrilled several feet away to a much shallower depth. The new well was used for waste disposal and later designated 216-T-3, and the old well was used as a groundwater monitoring well (299-W11-22). When use of reverse wells was discontinued in 1949, the wells were used as vadose zone monitoring wells. Well 216-T-3 is also designated as well 299-W11-71, and 216-Z-10 is designated as 299-W15-51 as shown in figure 2a (Parker 1944, Brown and Ruppert 1950).

The continuing need to dispose of 1C and 2C waste to the ground led the AEC to contract with the U.S. Geological Survey to drill a series of test wells in the late 1940s to evaluate the 200 Area plateau soil for waste disposal suitability, and for general groundwater research. These wells are shown in figure 3a (Brown and Ruppert 1950).

Monitoring wells in other locations were drilled as needed. In April 1963, well 299-W11-13 was drilled to the unusual depth of 152 m (500 ft) (see figure 5a). In the 1970s, additional wells were drilled in all three tank farms to monitor groundwater contamination (see figure 6a). An extensive discussion of monitoring wells inside the tank farms is included in Gaddis (1999).

DOE (1993) reports that leaks from the T, TX, or TY tank farms have contaminated the vadose zone but not the uppermost aquifer. Some cribs may have contaminated the uppermost aquifer, based on soil porosity and volume of waste discharged. Gross gamma logging of test wells in the vicinity of the cribs was done to verify contamination. Based on this evaluation, the 216-T-7 crib, the TY cribs, the 216-Z-5 cribs, and the 216-Z-7 trench were shown to have contaminated the uppermost aquifer. The 216-T-18 test crib, the 216-T-19 crib, the 216-T-12 pit, the 216-Z-10 reverse well, and the 216-Z-17 temporary trench have the potential to contaminate the uppermost aquifer, but no gamma logging was done to verify this. The 216-T-3 reverse well and 216-T-6 cribs, the 216-T-32 cribs, the 216-T-34 and 216-T-35 trenches, the TX trenches, the 216-T-5 trench, and the 216-Z-16 crib also have the potential to contaminate the uppermost aquifer, but gamma logging indicates that this has not occurred. The 216-T-6 trench, the T trenches, the 216-T-20 pit, the 216-Z-4 pit, and the 216-Z-6 temporary crib do not have the potential to contaminate the uppermost aquifer.

A listing of all occurrence reports for the T/TX/TY farms from 1973 to 1980 is contained in Appendix K.

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5.2 Drawings

T, TX, TY STUDY AREA REFERENCE DRAWING LIST

Drawing No.	Rev.	Title
HW-72182	1	Building 241-T Plot Plan
W-72184	1	H.E.W.-Bldg 241-T-153 & 241-T-252 ARRG T & Piping Div Boxes-Plans
H-2-00353	1	Waste Disposal Cribs 216-T-6, 216-T-B Cribs & Reverse Wells 216-T-3 & T-2
H-2-00439	0	Schematic Layout Bldg 241 T-U
H-2-00508	0	216-Z-6 Crib – Temporary Effluent Disposal Trench - 231-Z Bldg
H-2-00511	1	216-Z-7 Crib – Permanent Disposal Trench Near 231-Z Bldg
H-2-00558	1	216-T-32 & 216-B-7A & -7B & 201 TK Baffle Modifications
H-2-00578	1	Waste Disposal System Plan & Details 241-T, 216-T-32, T-7
H-2-00802	8	Plot Plan #2 Waste Storage 241-TX
H-2-00803	1	Plot Plan #3 Waste Storage 241-TX
H-2-00804	1	Plot Plan #4 Waste Storage 241-TX
H-2-00806	1	18 Tank Farm Finish Grading & Facilities
H-2-00807	11	18 Tank Farm General Layout
H-2-00821	0	Timber Crib and Piping Details 216-T-19
H-2-00828	8	Diversion Box Piping Layout
H-2-00840	6	Diversion Box Catch Tank Piping at 241-TX-155
H-2-00951	0	216-T-3, 216-T-6 By-Pass Line Near 361-T Tank Plot Plan
H-2-01204	73	First Cycle Evaporation 200-West Plot Plan
H-2-01495	0	200 West Area Steam Line Plot Plan
H-2-01984	1	Waste Settling & Cribbing Tie-In TK 241-112 To Tile Field
H-2-01988	0	Sect-5 Waste Settling & Cribbing Schematic Layout
H-2-02223	1	Waste Disposal Facilities 200 West Area General Layout
H-2-02398	0	224-Bldg Waste Diversion To 241-111 Tank
H-2-02430	1	200 West Area Process Waste System
H-2-02536	1	Catch Tank and Piping Replacement at Diversion Box 241-TX-155

T, TX, TY STUDY AREA REFERENCE DRAWING LIST

Drawing No.	Rev.	Title
H-2-02733	2	216-T-26, T-27, T-28, T-18, Cribs ADJ 241-TX & TY Farms
H-2-02735	0	216-T-18, T-26, T-27, T-28 Crib Details
H-2-02913	4	241-TY Farm 1st Cycle Scavenged TBP Waste 216-T-26,27 & 28 Cribs - Piping ARRGT
H-2-02923	3	Outside Piping TBP In-Farm Scavenging Arrangement
H-2-03019	1	Waste Routing 241-T-112 to 216-T-26,T-27,T-28 Cribs
H-2-03020	2	Waste Line 241-T-112 Tank to 241-TX-3 Crib
H-2-05101	1	Utility & Facility Key Plot Plan
H-2-25010	1	216-Z Cribs - Z-1 through Z-18 Drawing List
H-2-26074	0	Civil Plan and Profile Crib 216-Z-16
H-2-27271	1	Civil Key Plan High Salt Waste Transfer Facilities
H-2-27273	1	Civil Plan & Profile High Salt Waste Transfer Lines
H-2-32095	11	281-W-2A Industrial Burial Ground & 218-W-3 Dry Waste Burial Ground
H-2-32528	0	"Z" Plant Liquid Waste Disposal Sites 216-Z Series
H-2-32682	0	216-Z-17 Crib-Disposal Trench for 231-Z Wastes & 216-Z-10 Reverse Well
H-2-33451	4	Plot Plan & Flow Diagram 241-TX Tank Farm
H-2-33472	1	216-T-36 Crib Plan, Profile & Misc. Details
H-2-34359	2	Waste Routing Tank Farms 241-T,241-TX, 241-TY & 241-U
H-2-34762	0	Area Map (200-W)
H-2-35203	0	Piping Plot Plan Modification of 241-TX Tank Farm
H-2-35220	1	Civil Plot Plan & Drawing Index
H-2-35665	1	Piping Plot Plan and Dwg Index
H-2-36310	1	Piping Plot Plan 241-TX Tank Farm
H-2-36311	2	Piping Plot Plan 241-TY Tank Farm
H-2-36312	2	Piping Plot Plan 241- T Building Area
H-2-36313	2	Piping Plans Tanks 241-TX-103,104,107 & 108
H-2-36314	2	Piping Plans Tanks 241-TY-101,102 &104
H-2-36602	1	Piping Plot Plan 241-TX - TK-112

T, TX, TY STUDY AREA REFERENCE DRAWING LIST

Drawing No.	Rev.	Title
H-2-36632	2	Civil Plot Plan and Drawing Index
H-2-36634	1	Civil Plan & Profile 6" Waste Cooling Water TK 241-TX-112 TO 241-T Ret Basin
H-2-36801	1	Crib 216-T-19 By-Pass Line
H-2-36803	0	Plot Plan Salt Wells TK-113-TX & TK-114-TX
H-2-36848	0	3" BWCTL Line from 109 Pump Pit to West 42" Riser
H-2-36849	9	216-T-14 Thru 17 & 21 Thru 24 Waste Disposal Cribs Plot Plan - 200-W
H-2-38588	1	Salt Well – Pump Pit Installation 241-T Tank Farm
H-2-42072	1	Piping – Underground Process Plan & Sections - 101 Cascade
H-2-42073	2	Piping – Underground Process Plan & Sections - 105 Cascade
H-2-42390	2	Piping – Underground Process Plan & Sections
H-2-42391	1	Piping – Underground Process Plan & Sections
H-2-42691	2	Structural - Concrete – Plan & Sections - Pipe Trenches Sht #1
H-2-42692	2	Structural - Concrete – Plan & Sections - Pipe Trenches Sht #2
H-2-42693	2	Structural - Concrete – Plan & Sections - Pipe Trenches Sht #3
H-2-42694	2	Structural - Concrete - Plan & Sections - Pipe Trenches Sht #4
H-2-42695	2	Structural - Concrete - Plan & Sections - Pipe Trenches Sht #5
H-2-42696	2	Structural – Concrete - Plan & Sections - Pipe Trenches Sht 6
H-2-43011	3	Catch Tank Modifications at 241 TX-155
H-2-43490	0	Cooling Water Drain 242-T Bldg to Retention Basin Plan & Profile
H-2-44510	0	Key Plan Area - 200 West "T " Plant Facilities (Sht 6, 8, & 9)
H-2-44511	0	Area Map 200W "Z" Plant Facilities (Sht 102 & 103)
H-2-44511	1	Area Map 200W "T" Plant Facilities (Sht 109-111,117-119,125 -127, 133-135 & 141-143)
H-2-70836	1	Piping Controlled Water 241-T Tank Farm
H-2-70856	4	Piping and Instrumentation Plan 241-TX Tank Farm
H-2-70857	4	Piping & Instrumentation Plan & Details 241TX Tank Farm
H-2-71484	1	Piping Plan, Sections & Det

T, TX, TY STUDY AREA REFERENCE DRAWING LIST

Drawing No.	Rev.	Title
H-2-71640	1	Piping Enlarged Plan 241-TX & TY Areas
H-2-71641	1	Piping Enlarged Plan 241 -T & TY Areas
H-2-73052	3	Piping Waste Tank Isolation 241-T & 241-TY Tank Farm Plot Plans
H-2-73112	2	Piping Waste Tank Isolation 241-TX Farm - Plot Plan
H-2-73781	1	Civil Site Plans 241-BX and TX Tank Farms
H-2-73901	3	Piping Plan and Details
H-2-73902	1	Piping Enlarged Plans
H-2-73903	4	Piping Plan
H-2-73908	4	Piping Receiver Vault Plan & Elevations
H-2-73978	4	Piping & Instrumentation Plan & Details 241-T Tank Farm
H-2-73985	3	Piping & Instrumentation Plan & Details 241-TY Tank Farm
SK-2-17813	1	"T" Plant Liquid Waste Disposal Sites 216-T-Series

APPENDIX A

INTENTIONAL RELEASE QUANTITIES

INTENTIONAL RELEASE QUANTITIES

Crib	Location	Source	Type	Date	Quantity (L)	Comments
216-T-3	Reverse well E of T Farm	221-T; 224-T	5-6; 224	6/45- 8/46	1.13E+07	Replaced by T-6
216-T-5	Trench W of T Farm	221-T	2C	5/55	2.6E+06	Capacity reached
216-T-6	2 cribs E of T Farm	221-T	5-6	8/46- 5/51	4.5E+07	
216-T-7	Crib & tile field inside T Farm	221-T	2C	9/47 11/55	1.1E+08	Capacity reached
			5-6	6/51- 11/55		
			224	6/52- 11/55		
216-T-12	Pit NE corner of 207-T	207-T	Contaminated sludge	11/54	5.0E+06	Backfilled
216-T-14	Trench W of T Plant	221-T	1C	1/54	1E+06	Capacity reached
216-T-15	Trench W of T Plant	221-T	1C	2/54	1E+06	Capacity reached
216-T-16	Trench W of T Plant	221-T	1C	2/54	1E+06	Capacity reached
216-T-17	Trench W of T Plant	221-T	1C	2/54- 6/54	7.85E+05	Capacity reached
216-T-18	Crib E of TY Farm	221-T	Scavenged TBP	12/53	1E+06	Test crib
216-T-19	Crib and tile field S of TX Farm	242-T	Condensate	9/51- 7/55	4.31E+08	
		221-T	5-6/2C/224	12/55- 8/56		
		242-T	Condensate	12/65- 7/80		
216-T-20	Pit E of TX Farm	241-TX- 155	Contaminated nitric acid	11/52	1.89E+04	
216-T-21	Trench W of TX Farm	221-T	1C	6/54- 8/54	4.65E+05	Capacity reached
216-T-22	Trench W of TX Farm	221-T	1C	7/54- 8/54	1.53E+06	Capacity reached
216-T-23	Trench W of TX Farm	221-T	1C	7/54- 8/54	1.48E+06	Capacity reached

INTENTIONAL RELEASE QUANTITIES

Crib	Location	Source	Type	Date	Quantity (L)	Comments
216-T-24	Trench W of TX Farm	221-T	1C	8/54	1.53E+06	Capacity reached
216-T-25	Trench W of TX Farm	221-T	1C bottoms	9/54	3.0E+06	Backfilled
216-T-26	Crib E of TY Farm	221-T	Scavenged 1C	8/55-11/56	1.2E+07	
216-T-27	Crib E of TY Farm	340 Bldg	Lab waste	9/65-11/65	7.19E+06	
216-T-28	Crib E of TY Farm	340 Bldg	Lab Waste	2/60-12/66	4.23E+07	
216-T-32	2 cribs inside T Farm	224-T	224	11/46-5/52	2.9E+07	
216-T-34	Trench NE of T Farm	340 Bldg	Lab waste	5/66-3/67	1.73E+07	Capacity reached
216-T-35	Trench NE of T Farm	340 Bldg	Lab waste	3/67-12/67	5.72E+06	
216-T-36	Crib S of T Farm	221-T, 221-U	Decon waste, condensate	5/67-12/68	5.22E+05	
216-Z-4	Pit E of 231-Z	231-Z	231 waste	6/45	<1E+04	Backfilled
216-Z-5	2 cribs NE of 231-Z	231-Z	231 waste	6/45-2/47	3.1E+07	Plugged
216-Z-6	Crib E of 231-Z	231-Z	231 waste	6/45	9.8E+04	Temporary
216-Z-7	2 trenches E of 231-Z	231-Z	231 waste	2/47-2/67	4.8E+07	Capacity reached
216-Z-10	Dry well E of 231-Z	231-Z	231 waste	2/45-6/45	1.0E+06	Plugged
216-Z-16	Crib N of 231-Z	231-Z	231 waste	3/68-1/77	1.0E+08	
216-Z-17	Trench E of 231-Z	231-Z	231 waste	2/67-2/68	3.7E+07	Temporary

APPENDIX B

UNPLANNED RELEASE QUANTITIES

UNPLANNED RELEASE QUANTITIES

Site Number	Location	Date	Leak Type	Waste Type	Quantity (L)	Comments
UPR-200-W-5 (UN-216-W-5)	241-TX-155	1950	Diversion box leak	1C	unknown	
UPR-200-W-7	241-T-151	Spring 1950	Diversion box leak			
UPR-200-W-12	S of 242-T	Spring 1951	Riser leak	"Concentrate"	"A few gallons"	
UPR-200-W-14	Between 242-T and 207-T	10/52	Underground piping leak	Contaminated cooling water		
UPR-200-W-17	TX farm	9/12/52	Surface contamination	MW		
UPR-200-W-28	241-TX-155	Spring 1954	Diversion box leak			Remediated
UPR-200-W-29	Camden & 23rd	11/15/54	Underground piping leak	1C	<3800	See UPR-200-W-64.
UPR-200-W-62	Camden & 23rd	5/4/66	Underground piping leak	1C/TBP		See UPR-200-W-64.
UPR-200-W-63	Bridgeport & 23 rd	9/21/66	Spill from truck	Sr-90	1 Ci	
UPR-200-W-64	Camden & 23rd	2/13/69	Surface contamination	Previous leaks		See UPR-200-W-29, -62, and -97.
UPR-200-W-76	241-TX-155	8/24/77	Surface contamination	Rabbit dung		See UPR-200-W-113
UPR-200-W-97	Camden & 23rd	5/66	Underground piping leak			See UPR-200-W-64.
UPR-200-W-99	241-TX-153	9/21/66	Surface contamination			
UPR-200-W-100	241-TX farm	3/54	Underground piping leak	1C		
UPR-200-W-113 (UN-216-W-23)	241-TX-155	1979	Surface contamination	Previous leaks		See UPR-200-W-76
UPR-200-W-126	241-TX-153	5/8/75	Surface contamination	Broken gasket pieces		
UPR-200-W-129	241-TX-113	1/7/71	Pump pit flooding	Contaminated caustic		
UPR-200-W-130	231-Z	1/20/67	Underground piping leak			

UNPLANNED RELEASE QUANTITIES

Site Number	Location	Date	Leak Type	Waste Type	Quantity (L)	Comments
UPR-200-W-131	241-TX-155	3/13/53	Catch tank riser spray	TBP		
UPR-200-W-135	241-TX-155	4/5/54	Cave-in			See UPR-200-W-113
UPR-200-W-147	241-T-103	1973	Tank leak			
UPR-200-W-148	241-T-106	4/20/73	Tank leak		4.35E+05	
UPR-20-W-149	241-TX-107	1977	Tank leak		9463	
UPR-200-W-150	241-TY-103	1973	Tank leak		1.14E+04	
UPR-200-W-151	241-TY-104	1974	Tank leak		5300	
UPR-200-W-152	241-TY-105	1960	Tank leak		1.35E+05	
UPR-200-W-153	241-TY-106	1959	Tank leak		7.57E+04	
UPR-200-W-166 (UN-216-W-31)	NE of T farm	1991	Surface contamination			
UPR-200-W-167 (UN-216-W-32)	NE of TY farm	1986	Surface contamination			Remediated

APPENDIX C

HISTORICAL TIME LINE OF EVENTS

HISTORICAL TIME LINE OF EVENTS

1943-1944	Construction of T Plant and T Farm.
10/8/44	T Plant cold run.
12/26/44	T Plant begins operations. MW, 1C, 2C from T Plant discharged to T Farm.
2/2/45	First Pu shipped to Los Alamos. 231-W waste to reverse well.
5/45	216-Z-10 reverse well plugs. 231-W waste sent to 216-Z-4 pit, then 216-Z-6 temporary crib until 216-Z-5 permanent cribs are built later that month.
8/14/45	WWII ends. Large inventory of irradiated slugs still left in 200N.
12/45	Pipeline constructed to U Farm.
8/46	216-T-6 cribs built to replace 216-T-3 reverse well.
10/46	241-T-361 tank fills with solidified sludge. 224 waste sent to 241-T-201 tank (216-T-32 crib); 5-6 line to 216-T-6 modified to bypass 241-T-361.
1/1/47	General Electric replaces DuPont as Hanford prime contractor.
1947	R&D started on uranium recovery. Construction of vaults, pipelines, and TX farm.
2/47	216-Z-5 cribs clog; 231-Z waste rerouted to 216-Z-7 trench.
9/47	T Plant 2C waste is pumped from SSTs to 216-T-7 crib.
7/49	216-Z-1 ditch from 231-Z to just south of PFP is backfilled and replaced with underground pipeline.
1949	TBP process chosen for uranium recovery.
8/49	T Plant waste sent to TX Farm.
1949-52	Korean War expansion, following Soviet espionage and A-bomb development. TY farm and 242-T constructed, also REDOX, 100C, and fish lab.
1950	Diversion box 241-TX-155 overflows; waste runs down side of hill (UPR-200-W-5).
5/1/51	Begin evaporation of 1C waste in 242-T evaporator. Evaporator condensate discharged to 216-T-19.
Spring '51	Waste leak from riser at 242-T (UPR-200-W-12).
6/51	5-6 rerouted from 216-T-6 to 216-T-7.
6/52	200-series tanks removed from service; 224 rerouted from 216-T-32 to SSTs and 216-T-7.
Autumn '51	TX Farm contaminated while moving thermocouple tree (no UPR number).

HISTORICAL TIME LINE OF EVENTS

Spring '52	241-TX-107 contaminated during construction work (no UPR number).
9/52	TX Farm contaminated while moving sluice pump (UPR-200-W-17).
10/52	Cooling water leak between 242-T and 207-T (UPR-200-W-14).
11/52	1.33E+04 L (3.5E+03 gal) of 50% nitric acid sent to 241-TX-155 catch tank. Neutralized and pumped to 216-T-20 pit.
11/52	MW from T Plant and SSTs (in 200E and 200W) pumped to U Plant for UR operations.
1953	Scavenging UR waste for Cs, Sr, Co approved (never did find a way to scavenge Co).
3/53	1C disposal to trenches is approved.
3/13/53	241-TX-155 catch tank almost full of nitric acid. Soda ash added to neutralize waste prior to pumpout results in foam eruption from riser (UPR-200-W-131). Tank later abandoned in place and replaced.
6/20/53	242-T completes evaporating 1C.
7/53	UR waste to 242-T evaporator.
10/53	UR waste scavenging test run in U plant. Waste sent to 241-T-101.
12/53	Scavenged TBP waste discharged to 216-T-18 test crib.
1954	T Plant 1C sent to T (Jan-Jun) and TX trenches (Jun-Aug).
3/54	UPR-200-W-100, underground piping leak of 1C.
4/54	Jumper leak and cave-in at diversion box 241-TX-155 (UPR-200-W-135, -28).
6/54	Evaporator bottoms disposal to trenches approved.
9/54	1C bottoms to 216-T-25 (TX trench).
9/17/54	242-T completes evaporating TBP.
9/29/54	Scavenging of T Plant TBP waste begins in U Plant.
10/20/54	T Plant 1C scavenging begins. Scavenged 1C waste sent to TY Farm for settling.
11/54	Contaminated sludge from 207-T consolidated in 216-T-12 pit.
11/15/54	1C leak to ground (UPR-200-W-29).
12/2/54	242-T resumes evaporating stored 1C and re-evaporating 1C bottoms.
3/1/55	Scavenged 1C waste sent to 242-T.

HISTORICAL TIME LINE OF EVENTS

5/55	2C discharged to 216-T-5.
7/55	242-T evaporator shut down.
8/55	Scavenged 1C waste sent from TY Farm to 216-T-26 crib.
12/55	2C, 5-6, and 224 rerouted from 216-T-7 to 216-T-19.
3/20/56	T Plant shut down.
2/57	231-Z converted to Pu metallurgy lab.
2/57	T/TX Farm and U Farm MW recovery complete (TY not used).
1/1/58	UR Project completed.
8/59	20-kgal leak from TY-106, diatomite added (UPR-200-W-153).
2/60	T Plant decon waste to 216-T-28 crib.
9/60	35-kgal leak from 241-TY-105 (UPR-200-W-152).
10/63	340 lab waste to 216-T-28 crib.
9/65	340 lab waste to 216-T-27 crib.
11/65	Groundwater contamination discovered beneath TY cribs. 340 lab waste to 216-Z-7.
12/3/65	242-T modified for continuous evaporation and restarted for ITS.
5/66	216-Z-7 trench reaches radionuclide capacity. 340 lab waste to 216-T-34, 216-T-35.
5/4/66	Waste leak while using previously failed line between 241-T-152 and 241-TX-153 (see UPR-200-W-29) (UPR-200-W-62, -97).
9/21/66	Jumper from diversion box 216-TX-153 being moved to T Plant drips waste onto 23rd St. (UPR-200-W-63).
9/21/66	Airborne dust from 216-TX-153 contaminates Camden Ave (UPR-200-W-99).
1/20/67	Excavation for 216-Z-16 trench discovers underground pipe leak (UPR-200-W-130).
5/67	216-T-36 crib used for T Plant decon waste.
1/67	231-Z waste to 216-Z-17 temporary trench.
3/67	231-Z waste rerouted from 216-Z-17 to 216-Z-16 permanent crib.
2/13/69	Contaminated mud noted around 241-TX-153 (UPR-200-W-64).
1/7/71	Contaminated caustic spray from 241-TX-113 (UPR-200-W-129).

HISTORICAL TIME LINE OF EVENTS

1972	242-T modified to neutralize/concentrate PFP waste. 242-TA constructed.
5/72	216-T-4-2 pond & ditch replace 216-T-4-1 pond & ditch.
1973	Leak from 241-T-103 (UPR-200-W-147).
1973	Leak from 241-TY-103 (UPR-200-W-150).
4/20/73	115 kgal leak from 241-T-106 (UPR-200-W-148).
5/73	3-kgal leak from 241-TY-103 (UPR-200-W-147).
1974	Leak from 241-TY-104 (UPR-200-W-151).
1976	Begin interim stabilization.
5/8/75	Surface contamination of TX Farm from broken gasket pieces (UPR-200-W-126).
4/15/76	242-T shut down.
1977	Last discharge to 216-T-4-2 ditch & pond. Dry until stabilization in 1995.
1977	Leak from 241-TX-107 (UPR-200-W-149).
8/24/77	Surface contamination noticed at 241-TX-155 (UPR-200-W-76, -113).
1980	244-TX DCRT constructed.
1980	241-TX-152 constructed to replace 241-TX-155.
7/24/80	216-T-19 crib decommissioned.
1986	Surface contamination noted at TY Farm (UPR-200-W-167).
1992	Surface contamination noted at T trenches (UPR-200-W-166).

APPENDIX D

CRIB 216-T-7 DISCHARGE HISTORY

CRIB 216-T-7 DISCHARGE HISTORY

Date	Volume (L)	Pu (g)	β (Ci)	Waste Type	Comments	Reference
Sep-47	1.59E+06	Unknown	Unknown	2C	From 241-T-111	HAN-45802
Nov-47	7.57E+04	Unknown	Unknown	2C	From 241-T-112	WHC-MR-0132
Apr-48	1.36E+06	Unknown	Unknown	2C	From 241-T-105	HW-9922
Jul-48	1.56E+06	Unknown	Unknown	2C	From 241-T-106	WHC-MR-0132
Aug-48	1.70E+06	Unknown	Unknown	2C	From 241-T-112	HW-11226
Mar-49	5.73E+05	Unknown	Unknown	2C	From 241-T-112	HW-12937
Apr-49	1.21E+06	Unknown	Unknown	2C	From 241-T-112	HW-13190
May-49	2.08E+05	Unknown	Unknown	2C	From 241-T-112	HW-13561
Nov-49	8.14E+05	Unknown	Unknown	2C	From 241-T-112	HW-15267
Dec-49	2.19E+06	Unknown	Unknown	2C	From 241-T-112	HW-15550
Jun-50	4.88E+05	Unknown	Unknown	2C	From 241-T-112	HW-18221
Oct-50	1.24E+06	Unknown	Unknown	2C	From 241-T-112	HW-19325
Nov-50	1.90E+06	5.70	28.00	2C	From 241-T-112	HW-20583
Dec-50	4.50E+05	3.20	9.00	2C	From 241-T-112	HW-20583
Mar-51	5.41E+05	N/A	N/A	2C	From 241-T-112	Original records
Apr-51	0.00	N/A	N/A	2C	Hard piped to 241-T-112	Original records
May-51	3.83E+05	N/A	N/A	2C		Original records
Jun-51	4.78E+05	N/A	N/A	2C & 5-6		Original records
Jul-51	4.78E+05	N/A	N/A	2C & 5-6		Original records
Aug-51	4.50E+05	N/A	N/A	2C & 5-6		Original records
Sep-51	4.55E+05	N/A	N/A	2C & 5-6		Original records
Oct-51	5.38E+05	N/A	N/A	2C & 5-6		Original records
Nov-51	5.86E+05	N/A	N/A	2C & 5-6		Original records
Dec-51	5.31E+05	N/A	N/A	2C & 5-6		Original records
Jan-52	1.11E+05	0.40	29.00	2C & 5-6		HW-25301
Feb-52	8.43E+05	8.60	47.00	2C & 5-6		HW-25301
Mar-52	1.18E+06	1.70	79.00	2C & 5-6		HW-25301
Apr-52	1.08E+06	2.30	43.00	2C & 5-6		HW-25301

CRIB 216-T-7 DISCHARGE HISTORY

Date	Volume (L)	Pu (g)	β (Ci)	Waste Type	Comments	Reference
May-52	4.55E+05	1.30	13.00	2C & 5-6		HW-25301
Jun-52	5.39E+05	N/A	N/A	2C/5-6/224		HW-25301
Jul-52	1.39E+06	4.00	49.00	2C/5-6/224		HW-33591
Aug-52	1.64E+06	0.90	156.00	2C/5-6/224		HW-33591
Sep-52	5.50E+05	1.60	40.00	2C/5-6/224		HW-33591
Oct-52	9.80E+05	0.60	24.00	2C/5-6/224		HW-33591
Nov-52	9.70E+05	0.50	11.00	2C/5-6/224		HW-33591
Dec-52	1.33E+06	0.50	15.00	2C/5-6/224		HW-33591
Jan-53	9.70E+05	0.80	12.00	2C/5-6/224		HW-33591
Feb-53	1.17E+06	0.20	13.00	2C/5-6/224		HW-33591
Mar-53	1.69E+06	0.30	16.00	2C/5-6/224		HW-33591
Apr-53	9.60E+05	0.20	8.00	2C/5-6/224		HW-33591
May-53	1.08E+06	15.80	11.00	2C/5-6/224		HW-33591
Jun-53	1.51E+06	1.20	31.00	2C/5-6/224		HW-33591
Jul-53	9.50E+05	0.60	9.00	2C/5-6/224		HW-33591
Aug-53	1.08E+06	0.20	10.00	2C/5-6/224		HW-33591
Sep-53	1.21E+06	3.20	12.00	2C/5-6/224		HW-33591
Oct-53	1.32E+06	3.20	97.00	2C/5-6/224		HW-33591
Nov-53	1.52E+06	0.20	55.00	2C/5-6/224		HW-33591
Dec-53	1.75E+06	0.30	50.00	2C/5-6/224		HW-33591
Jan-54	2.10E+06	0.20	54.00	2C/5-6/224		HW-33591
Feb-54	1.97E+06	26.80	740.00	2C/5-6/224		HW-33591
Mar-54	2.13E+06	3.20	640.00	2C/5-6/224		HW-33591
Apr-54	1.00E+06	0.30	100.00	2C/5-6/224		HW-33591
May-54	1.91E+06	0.60	1.40	2C/5-6/224		HW-33591
Jun-54	2.01E+06	0.50	0.20	2C/5-6/224		HW-33591
Jul-54	2.34E+06	0.37	0.56	2C/5-6/224		HW-38562
Aug-54	2.42E+06	0.30	0.62	2C/5-6/224		HW-38562
Sep-54	2.48E+06	0.47	2.98	2C/5-6/224		HW-38562
Oct-54	2.18E+06	0.23	1.08	2C/5-6/224		HW-38562

CRIB 216-T-7 DISCHARGE HISTORY

Date	Volume (L)	Pu (g)	β (Ci)	Waste Type	Comments	Reference
Nov-54	2.27E+06	1.64	16.00	2C/5-6/224		HW-38562
Dec-54	2.67E+06	0.45	1.24	2C/5-6/224		HW-38562
Jan-55	3.18E+06	1.06	2.72	2C/5-6/224		HW-38562
Feb-55	2.64E+06	0.20	0.63	2C/5-6/224		HW-38562
Mar-55	2.71E+06	0.41	106.00	2C/5-6/224		HW-38562
Apr-55	2.21E+06	0.45	1.09	2C/5-6/224		HW-38562
May-55	2.98E+06	6.62	76.80	2C/5-6/224		HW-38562
Jun-55	3.26E+06	0.44	1.17	2C/5-6/224		HW-38562
Jul-55	3.09E+06	4.87	4.20	2C/5-6/224		HW-44784
Aug-55	3.26E+06	0.94	26.30	2C/5-6/224		HW-44784
Sep-55	3.90E+06	0.90	0.06	2C/5-6/224		HW-44784
Oct-55	2.96E+06	1.02	3.10	2C/5-6/224		HW-44784
Nov-55	2.42E+06	3.06	0.20	2C/5-6/224		HW-44784
Dec-55	0.00	0.00	0.00	2C/5-6/224		HW-44784
Totals	1.04E+08	113	2647			

Curies are uncorrected for decay.

APPENDIX E

CRIB 216-T-19 DISCHARGE HISTORY

CRIB 216-T-19 DISCHARGE HISTORY

FIRST EVAPORATOR CAMPAIGN, 1951-1956							
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	Waste Type	Reference	Comments
May-51	5.72E+05	N/A	N/A	N/A	1C condensate	HW-21260	242-T startup
Jun-51	1.08E+06	N/A	N/A	N/A	1C condensate	HW-21506	
Jul-51	1.53E+06	N/A	N/A	N/A	1C condensate	HW-21802	
Aug-51	1.67E+06	N/A	N/A	N/A	1C condensate	HW-22075	
Sep-51	1.47E+06	N/A	N/A	N/A	1C condensate	HW-22304	
Oct-51	1.08E+06	N/A	N/A	N/A	1C condensate	HW-22610	
Nov-51	1.58E+06	N/A	N/A	N/A	1C condensate	HW-22875	
Dec-51	7.89E+05	N/A	N/A	N/A	1C condensate	HW-23140	
Jan-52	1.63E+06	N/A	N/A	0.070	1C condensate	HW-25301	
Feb-52	1.49E+06	N/A	N/A	0.034	1C condensate	HW-25301	
Mar-52	1.52E+06	N/A	N/A	0.198	1C condensate	HW-25301	
Apr-52	1.04E+06	N/A	N/A	0.034	1C condensate	HW-25301	
May-52	8.40E+05	N/A	N/A	0.015	1C condensate	HW-25301	
Jun-52	1.47E+06	N/A	0.097	0.015	1C condensate	HW-25301	
Jul-52	1.48E+06	N/A	0.060	0.020	1C condensate	HW-33591	
Aug-52	3.00E+05	N/A	0.020	0.010	1C condensate	HW-33591	
Sep-52	1.10E+05	N/A	0.020	0.000	1C condensate	HW-33591	
Oct-52	0.00	N/A	0.00	0.00	N/A	HW-33591	Down for repairs
Nov-52	0.00	N/A	0.00	0.00	N/A	HW-33591	Down for repairs
Dec-52	0.00	N/A	0.00	0.00	N/A	HW-33591	Down for repairs
Jan-53	0.00	N/A	0.00	0.00	N/A	HW-33591	Down for repairs
Feb-53	2.20E+05	N/A	0.020	0.010	1C condensate	HW-33591	
Mar-53	7.50E+05	N/A	0.070	0.030	1C condensate	HW-33591	
Apr-53	6.80E+05	N/A	0.840	0.020	1C condensate	HW-33591	
May-53	4.20E+05	N/A	0.520	0.010	1C condensate	HW-33591	

CRIB 216-T-19 DISCHARGE HISTORY

FIRST EVAPORATOR CAMPAIGN, 1951-1956							
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	Waste Type	Reference	Comments
Jun-53	6.10E+05	N/A	0.030	1.810	1C condensate	HW-33591	
Jul-53	5.10E+05	N/A	0.030	0.080	TBP cond	HW-33591	
Aug-53	1.05E+06	N/A	0.070	0.170	TBP cond	HW-33591	
Sep-53	9.40E+05	N/A	0.070	0.150	TBP cond	HW-33591	
Oct-53	6.10E+05	N/A	0.050	0.100	TBP cond	HW-33591	
Nov-53	5.30E+05	N/A	0.050	0.010	TBP cond	HW-33591	
Dec-53	6.10E+05	N/A	0.050	0.040	TBP cond	HW-33591	
Jan-54	5.40E+05	N/A	0.050	0.090	TBP cond	HW-33591	
Feb-54	1.80E+05	N/A	0.020	0.030	TBP cond	HW-33591	
Mar-54	5.70E+05	N/A	0.050	0.090	TBP cond	HW-33591	
Apr-54	4.10E+05	N/A	0.030	0.020	TBP cond	HW-33591	
May-54	5.90E+05	N/A	0.050	0.070	TBP cond	HW-33591	
Jun-54	6.00E+05	N/A	0.020	0.180	TBP cond	HW-33591	
Jul-54	6.80E+05	N/A	0.026	0.302	TBP cond	HW-38562	
Aug-54	6.16E+05	N/A	0.047	0.027	TBP cond	HW-38562	
Sep-54	3.97E+05	N/A	0.031	0.118	TBP cond	HW-38562	242-T shutdown
Oct-54	0.00	N/A	0.00	0.00	N/A	HW-38562	
Nov-54	0.00	N/A	0.00	0.00	N/A	HW-38562	
Dec-54	6.88E+05	N/A	0.040	0.020	1C	HW-38562	242-T restart
Jan-55	8.99E+05	N/A	0.718	0.233	1C	HW-38562	
Feb-55	8.12E+05	N/A	0.062	0.096	1C	HW-38562	
Mar-55	8.46E+05	N/A	0.049	0.130	Scav 1C	HW-38562	
Apr-55	7.93E+05	N/A	0.074	0.216	Scav 1C	HW-38562	
May-55	5.53E+05	N/A	0.248	0.920	Scav 1C	HW-38562	
Jun-55	3.77E+05	N/A	0.252	0.069	Scav 1C	HW-38562	
Jul-55	2.26E+05	N/A	0.001	0.001	Scav 1C	HW-44784	
Aug-55	0.00	N/A	0.00	0.00	Scav 1C	HW-44784	242-T shutdown
Sep-55	0.00	N/A	0.00	0.00	N/A	HW-44784	

CRIB 216-T-19 DISCHARGE HISTORY

FIRST EVAPORATOR CAMPAIGN, 1951-1956							
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	Waste Type	Reference	Comments
Oct-55	0.00	N/A	0.00	0.00	N/A	HW-44784	
Nov-55	0.00	N/A	0.00	0.00	N/A	HW-44784	
Dec-55	2.12E+06	N/A	0.029	0.054	2C/5-6/224	HW-44784	Formerly to 216-T-7
Jan-56	1.60E+06	N/A	5.410	0.036	2C/5-6/224	HW-44784	
Feb-56	1.87E+06	N/A	1.880	1560.00	2C/5-6/224	HW-44784	
Mar-56	1.79E+06	N/A	1.370	224.00	2C/5-6/224	HW-44784	
Apr-56	1.61E+06	N/A	0.487	166.00	2C/5-6/224	HW-44784	
May-56	5.25E+05	N/A	0.316	33.90	2C/5-6/224	HW-44784	
Jun-56	5.07E+05	N/A	0.154	22.90	2C/5-6/224	HW-44784	
Jul-56	2.98E+05	N/A	0.010	10.10	2C/5-6/224	HW-48518	
Aug-56	2.64E+05	N/A	0.180	10.20	2C/5-6/224	HW-48518	T Plant shutdown
Totals	4.70E+07		13.60	2032.63			

Curies are uncorrected for decay.

CRIB 216-T-19 DISCHARGE HISTORY

SECOND EVAPORATOR CAMPAIGN, 1965-1976									
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	Reference
Dec-65	1.41E+06								HAN-93551
Jan-66	4.77E+06	N/A	N/A	0.04	N/A	N/A	0.03	N/A	ISO-698
Feb-66	2.07E+06	N/A	N/A	0.03	N/A	N/A	0.01	N/A	ISO-698
Mar-66	2.51E+06	N/A	N/A	0.01	N/A	N/A	0.01	N/A	ISO-698
Apr-66	2.45E+06	N/A	N/A	0.65	N/A	N/A	0.39	N/A	ISO-698
May-66	2.46E+06	N/A	N/A	3.90	N/A	N/A	2.60	N/A	ISO-698
Jun-66	2.52E+06	N/A	N/A	0.20	N/A	N/A	0.10	N/A	ISO-698
Jul-66	2.48E+06	N/A	N/A	0.10	N/A	N/A	0.10	N/A	ISO-698
Aug-66	2.58E+06	N/A	N/A	2.90	N/A	N/A	2.90	N/A	ISO-698
Sep-66	1.99E+06	N/A	N/A	0.02	N/A	N/A	0.02	N/A	ISO-698
Oct-66	3.21E+06	N/A	N/A	19.40	N/A	N/A	10.80	N/A	ISO-698
Nov-66	3.01E+06	N/A	N/A	0.97	N/A	N/A	0.78	N/A	ISO-698
Dec-66	3.29E+06	N/A	N/A	0.11	N/A	N/A	0.05	N/A	ISO-698
Jan-67	2.08E+06	N/A	N/A	2.64	N/A	N/A	1.68	N/A	ARH-486
Feb-67	3.06E+06	N/A	N/A	0.08	N/A	N/A	0.08	N/A	ARH-486
Mar-67	2.60E+06	N/A	N/A	0.48	N/A	N/A	0.48	N/A	ARH-486
Apr-67	2.18E+06	N/A	N/A	0.12	N/A	N/A	0.07	N/A	ARH-486
May-67	1.91E+06	N/A	N/A	0.06	N/A	N/A	0.04	N/A	ARH-486
Jun-67	1.87E+06	N/A	N/A	0.08	N/A	N/A	0.06	N/A	ARH-486
Jul-67	1.92E+06	N/A	N/A	0.81	N/A	N/A	0.59	N/A	ARH-486
Aug-67	1.10E+05	N/A	N/A	0.90	N/A	N/A	N/A	N/A	ARH-486
Sep-67	2.30E+06	5.00E-03	1.00E-03	0.04	5.00E-03	7.00E-03	0.02	N/A	ARH-486
Oct-67	2.12E+06	5.00E-03	1.00E-03	0.09	5.00E-03	1.00E-02	0.04	N/A	ARH-486
Nov-67	1.99E+06	1.00E-03	1.00E-03	0.02	2.00E-03	5.00E-03	0.02	N/A	ARH-486
Dec-67	1.59E+06	1.00E-03	6.00E-02	0.34	1.00E-03	8.00E-02	0.24	N/A	ARH-486
Jan-68	1.51E+06	4.55E-03	1.00E-03	0.01	N/A	N/A	N/A	N/A	ARH-1159
Feb-68	1.36E+06	4.55E-04	1.00E-02	0.05	1.00E-03	4.00E-02	0.01	5.00E-02	ARH-1159

CRIB 216-T-19 DISCHARGE HISTORY

SECOND EVAPORATOR CAMPAIGN, 1965-1976									
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	Reference
Mar-68	1.78E+06	1.36E-02	2.00E-03	3.60	4.00E-03	7.00E-01	2.20	6.60E-01	ARH-1159
Apr-68	1.78E+06	1.82E-02	1.00E-03	0.41	3.00E-03	8.00E-02	0.26	1.10E-02	ARH-1159
May-68	1.63E+06	5.00E-03	1.00E-03	0.91	1.00E-03	2.00E-03	0.43	N/A	ARH-1159
Jun-68	5.30E+05	2.27E-02	4.00E-02	0.28	4.00E-04	1.00E-02	0.18	7.10E-02	ARH-1159
Jul-68	1.63E+06	8.64E-02	8.00E-03	0.64	2.00E-04	5.00E-03	0.28	1.90E-02	ARH-1159
Aug-68	1.25E+06	8.60E-02	3.00E-03	1.31	N/A	7.00E-03	0.72	N/A	ARH-1159
Sep-68	1.40E+06	9.09E-03	1.00E-02	0.34	N/A	2.00E-03	0.13	3.70E-02	ARH-1159
Oct-68	1.44E+06	9.00E-03	1.00E-02	0.26	N/A	1.00E-03	0.09	3.10E-02	ARH-1159
Nov-68	6.82E+05	5.00E-03	6.00E-03	0.10	N/A	1.00E-03	0.06	N/A	ARH-1159
Dec-68	6.82E+05	5.00E-03	6.50E-03	0.20	N/A	1.00E-03	0.12	7.00E-03	ARH-1159
Jan-69	1.14E+06	6.82E-03	1.10E-02	1.70	N/A	1.40E-03	0.28	1.30E-02	ARH-1608
Feb-69	1.44E+06	3.00E-04	1.40E-02	1.30	N/A	2.30E-03	0.28	1.40E-02	ARH-1608
Mar-69	9.20E+05	1.10E-04	5.90E-05	0.26	N/A	5.00E-04	0.28	1.30E-02	ARH-1608
Apr-69	1.89E+06	2.82E+00	8.10E-05	0.49	N/A	1.27E-03	0.28	1.40E-02	ARH-1608
May-69	1.57E+06	8.18E-03	7.00E-05	0.90	N/A	1.90E-03	0.59	3.20E-02	ARH-1608
Jun-69	1.46E+06	7.73E-03	1.10E-04	0.55	N/A	9.70E-04	0.32	1.50E-02	ARH-1608
Jul-69	1.50E+06	8.00E-03	4.00E-05	0.32	N/A	7.80E-04	0.14	2.50E-02	ARH-1608
Aug-69	1.47E+06	8.00E-03	2.00E-04	0.37	N/A	1.80E-03	0.18	7.80E-03	ARH-1608
Sep-69	1.51E+06	1.00E-02	9.00E-05	0.55	N/A	1.20E-03	0.26	8.00E-03	ARH-1608
Oct-69	1.18E+06	7.00E-03	5.00E-05	0.68	3.80E-04	2.10E-03	0.32	1.40E-02	ARH-1608
Nov-69	4.96E+05	3.14E-03	6.00E-05	0.58	5.00E-05	3.30E-03	0.31	3.90E-03	ARH-1608
Dec-69	2.12E+05	1.10E-03	5.90E-04	0.30	6.00E-05	2.70E-03	0.09	2.00E-03	ARH-1608
Jan-70	8.02E+05	8.64E-03	8.65E-04	0.548	7.86E-05	6.99E-03	0.204	2.55E-03	ARH-2015
Feb-70	7.19E+05	7.73E-03	8.99E-05	0.137	4.23E-05	1.60E-03	0.088	3.54E-03	ARH-2015
Mar-70	4.85E+05	3.20E-03	1.93E-04	0.187	8.06E-05	2.47E-03	0.114	3.71E-03	ARH-2015
Apr-70	7.12E+05	2.57E-03	1.04E-04	0.186	8.82E-05	3.62E-03	0.106	1.14E-03	ARH-2015
May-70	1.80E+06	1.00E-02	1.85E-04	0.418	2.90E-04	1.40E-02	0.264	2.76E-03	ARH-2015
Jun-70	1.65E+06	9.10E-03	7.79E-05	0.205	2.22E-05	1.87E-03	0.137	2.22E-03	ARH-2015

CRIB 216-T-19 DISCHARGE HISTORY

SECOND EVAPORATOR CAMPAIGN, 1965-1976									
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	Reference
Jul-70	1.17E+06	6.40E-03	5.02E-06	0.548	2.28E-04	3.08E-03	0.376	7.52E-03	ARH-2015
Aug-70	1.06E+06	5.45E-03	4.55E-05	0.109	6.42E-06	1.20E-03	0.071	2.08E-03	ARH-2015
Sep-70	5.30E+05	4.34E-04	3.64E-05	0.042	3.63E-05	1.86E-03	0.045	6.00E-04	ARH-2015
Oct-70	9.35E+05	5.00E-03	1.04E-04	0.059	3.11E-05	8.10E-04	0.043	8.39E-04	ARH-2015
Nov-70	1.06E+06	5.45E-03	7.75E-05	0.135	3.64E-05	6.55E-04	0.066	9.68E-04	ARH-2015
Dec-70	9.99E+05	5.00E-03	6.44E-05	0.173	4.70E-05	2.16E-03	0.100	1.39E-03	ARH-2015
Jan-71	1.45E+06	7.65E-03	6.23E-05	0.141	5.39E-05	2.29E-03	0.096	1.61E-03	ARH-2353
Feb-71	1.34E+06	7.26E-03	1.44E-04	0.204	5.98E-05	3.79E-03	0.106	5.91E-03	ARH-2353
Mar-71	1.18E+06	6.74E-03	7.62E-05	0.084	4.22E-05	4.31E-03	0.051	2.47E-03	ARH-2353
Apr-71	1.09E+06	5.98E-03	7.04E-05	0.071	1.42E-04	1.88E-03	0.039	9.82E-04	ARH-2353
May-71	1.28E+06	6.77E-03	8.94E-05	0.108	1.05E-04	3.73E-03	0.058	9.15E-04	ARH-2353
Jun-71	9.79E+05	5.69E-03	7.58E-06	0.120	6.65E-05	7.84E-03	0.061	1.42E-03	ARH-2353
Jul-71	1.15E+06	6.89E-03	4.55E-04	1.002	5.86E-04	7.86E-02	0.610	3.64E-03	ARH-2353
Aug-71	1.75E+06	9.75E-03	4.17E-04	0.618	1.67E-04	1.12E-01	0.157	6.27E-03	ARH-2353
Sep-71	1.55E+06	8.62E-03	9.97E-05	0.244	1.56E-04	1.37E-02	0.142	1.84E-03	ARH-2353
Oct-71	1.27E+06	6.96E-03	5.39E-05	0.116	1.61E-04	3.98E-03	0.074	7.93E-04	ARH-2353
Nov-71	1.43E+06	8.53E-03	6.76E-05	0.290	1.91E-04	1.93E-03	0.263	1.37E-03	ARH-2353
Dec-71	1.24E+06	9.41E-03	6.97E-05	0.536	1.04E-04	1.35E-03	0.401	1.02E-03	ARH-2353
Jan-72	1.48E+06	1.24E-02	3.58E-04	1.610	1.35E-04	3.25E-03	0.796	2.82E-03	ARH-2757
Feb-72	1.33E+06	7.25E-03	5.71E-05	0.598	1.31E-04	2.49E-03	0.290	1.25E-03	ARH-2757
Mar-72	1.36E+06	7.73E-03	6.41E-05	0.300	1.93E-04	1.97E-03	0.145	9.24E-04	ARH-2757
Apr-72	1.24E+06	6.57E-03	4.05E-05	0.251	1.40E-04	2.48E-03	0.117	1.44E-03	ARH-2757
May-72	1.34E+06	7.19E-03	7.51E-05	0.287	1.54E-04	4.11E-03	0.140	1.92E-03	ARH-2757
Jun-72	1.22E+06	6.59E-03	5.04E-05	0.324	1.31E-04	3.36E-03	0.151	1.34E-03	ARH-2757
Jul-72	1.16E+06	6.26E-03	5.99E-05	0.407	9.15E-05	4.05E-03	0.202	2.09E-03	ARH-2757
Aug-72	1.33E+06	7.15E-03	6.27E-05	0.560	1.69E-04	6.66E-03	0.282	1.97E-03	ARH-2757
Sep-72	1.33E+06	7.15E-03	5.46E-05	0.554	2.41E-04	7.46E-03	0.266	2.71E-03	ARH-2757
Oct-72	1.38E+06	7.46E-03	5.38E-05	0.542	1.29E-04	6.91E-03	0.262	3.66E-03	ARH-2757

CRIB 216-T-19 DISCHARGE HISTORY

SECOND EVAPORATOR CAMPAIGN, 1965-1976									
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	Reference
Nov-72	1.36E+06	7.27E-03	9.35E-05	0.657	2.20E-04	4.94E-03	0.324	6.84E-03	ARH-2757
Dec-72	1.36E+06	7.31E-03	5.26E-05	0.475	1.24E-04	1.03E-02	0.223	7.56E-03	ARH-2757
Jan-73	1.27E+06	6.83E-03	5.46E-05	0.592	1.25E-04	1.03E-02	0.261	1.34E-02	ARH-2806
Feb-73	1.27E+06	1.44E-02	5.46E-05	0.640	2.75E-04	8.47E-03	0.297	2.23E-02	ARH-2806
Mar-73	2.35E+05	2.40E-03	1.41E-03	0.825	3.87E-04	2.46E-01	0.098	7.15E-02	ARH-2806
Apr-73	7.22E+05	4.20E-03	4.35E-04	0.610	8.31E-05	1.03E-01	0.159	6.56E-03	ARH-2806
May-73	1.06E+06	5.72E-02	1.00E-03	0.674	1.56E-04	3.61E-02	0.286	1.62E-02	ARH-2806
Jun-73	4.13E+05	2.29E-03	1.70E-03	0.181	9.70E-05	1.68E-02	0.072	3.16E-03	ARH-2806
Jul-73	1.80E+05	1.09E-03	4.42E-04	0.086	2.76E-05	6.66E-03	0.035	1.68E-03	ARH-2806
Aug-73	1.06E+06	5.08E-03	1.28E-02	0.383	1.10E-04	1.43E-02	0.168	3.95E-03	ARH-2806
Sep-73	6.48E+05	4.45E-03	1.03E-02	0.243	6.46E-05	1.88E-02	0.104	2.86E-03	ARH-2806
Oct-73	7.07E+05	3.85E-03	2.58E-05	0.325	7.66E-05	9.90E-03	0.153	2.84E-03	ARH-2806
Nov-73	3.09E+05	1.80E-03	8.67E-04	0.092	3.52E-05	3.92E-03	0.039	2.49E-03	ARH-2806
Dec-73	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ARH-2806
Jan-74	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ARH-3093
Feb-74	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ARH-3093
Mar-74	1.03E+05	5.53E-04	2.53E-04	0.060	1.05E-05	6.21E-03	0.015	2.56E-04	ARH-3093
Apr-74	2.94E+05	1.61E-03	1.89E-03	0.094	2.62E-05	1.76E-03	0.045	5.55E-04	ARH-3093
May-74	9.27E+05	5.39E-03	1.99E-03	0.238	9.19E-05	9.80E-03	0.105	3.23E-03	ARH-3093
Jun-74	5.30E+05	3.14E-03	4.10E-03	0.459	7.30E-05	1.30E-02	0.217	1.43E-03	ARH-3093
Jul-74	7.31E+05	3.96E-03	5.44E-03	0.316	8.24E-05	2.84E-02	0.121	2.95E-03	ARH-3093
Aug-74	8.32E+05	4.57E-03	5.19E-03	0.376	3.03E-04	3.76E-01	0.598	7.98E-03	ARH-3093
Sep-74	8.21E+05	8.33E-03	2.73E-03	0.625	5.03E-04	1.25E-02	0.221	1.84E-02	ARH-3093
Oct-74	8.64E+05	8.72E-03	2.58E-03	0.591	2.72E-04	8.49E-02	0.152	1.11E-02	ARH-3093
Nov-74	6.90E+05	6.98E-03	4.59E-03	0.344	4.34E-04	2.73E-02	0.132	1.41E-02	ARH-3093
Dec-74	7.37E+05	7.45E-03	2.10E-03	0.245	1.24E-04	1.49E-02	0.094	9.03E-03	ARH-3093
Jan-75	2.51E+05	2.58E-03	5.94E-05	0.075	3.44E-04	5.18E-03	0.008	5.47E-03	ARH-CD-371
Feb-75	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ARH-CD-371

CRIB 216-T-19 DISCHARGE HISTORY

SECOND EVAPORATOR CAMPAIGN, 1965-1976									
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	Reference
Mar-75	1.40E+04	1.44E-04	3.32E-06	0.004	6.73E-06	2.90E-04	0.000	3.06E-04	ARH-CD-371
Apr-75	1.88E+05	1.94E-03	1.56E-04	0.074	2.22E-03	6.56E-03	0.004	N/A	ARH-CD-371
May-75	2.59E+05	2.66E-03	5.80E-04	0.113	4.96E-04	7.87E-03	0.037	8.56E-03	ARH-CD-371
Jun-75	1.91E+05	1.97E-03	2.30E-04	0.125	2.95E-04	7.11E-03	0.032	9.79E-03	ARH-CD-371
Jul-75	5.42E+05	5.50E-03	2.59E-04	0.170	4.16E-04	2.09E-02	0.049	1.65E-02	ARH-CD-371
Aug-75	8.94E+05	9.02E-03	6.56E-04	0.400	1.87E-04	1.01E-01	0.083	6.85E-03	ARH-CD-371
Sep-75	8.06E+05	8.16E-03	2.22E-04	0.492	3.41E-04	7.41E-02	0.094	6.82E-03	ARH-CD-371
Oct-75	8.65E+05	8.76E-03	5.12E-04	0.358	1.81E-04	3.06E-02	0.144	8.23E-03	ARH-CD-371
Nov-75	4.86E+05	4.93E-03	2.26E-04	0.292	2.89E-04	3.44E-02	0.100	5.36E-03	ARH-CD-371
Dec-75	5.01E+05	5.08E-03	1.38E-03	0.311	2.16E-04	3.12E-02	0.096	5.89E-03	ARH-CD-371
Jan-76	5.00E+05	N/A	2.58E-04	0.210	N/A	2.30E-02	0.017	1.98E-03	ARH-CD-743
Feb-76	3.24E+05	N/A	1.10E-03	0.261	N/A	2.19E-02	0.063	3.57E-03	ARH-CD-743
Mar-76	5.54E+05	N/A	2.16E-06	0.199	N/A	2.63E-02	0.061	4.68E-03	ARH-CD-743
Apr-76	8.71E+04	N/A	2.07E-04	0.047	N/A	4.51E-03	0.012	6.90E-04	ARH-CD-743

Curies are uncorrected for decay.

CRIB 216-T-19 DISCHARGE HISTORY

216-T-19 DISCHARGE SUMMARY											
Date	Volume (L)	U (kg)	Pu (g)	β (Ci)							
1951	9.78E+06	N/A	0.000	0.000							
1952	9.88E+06	N/A	0.197	0.396							
1953	6.93E+06	N/A	1.800	2.430							
1954	5.27E+06	N/A	0.364	0.947							
1955	6.63E+06	N/A	1.433	1.719					Corrections for Additions		
1956	8.46E+06	N/A	9.807	2027.136	⁶⁰ Co (Ci)	⁹⁰ Sr (Ci)	¹³⁷ Cs (Ci)	¹⁰⁶ Ru (Ci)	Steam	Vac jet	Total
1965	1.41E+06	0.000	0.00E+00	0.000	0.00E+00	0.000	0.000	0.000	Unknown		
1966	3.33E+07	N/A	N/A	28.330	N/A	N/A	17.790	N/A	Unknown, but Possible		
1967	2.37E+07	0.012	6.30E-02	5.660	1.30E-02	0.102	3.320	0.000	Estimated		4.88E+07
1968	1.57E+07	0.265	9.85E-02	8.110	9.60E-03	0.849	4.480	0.886	2.03E+07	2.87E+07	4.90E+07
1969	1.48E+07	2.879	2.64E-02	8.000	4.90E-04	0.020	3.315	0.162	1.78E+07	3.52E+07	5.30E+07
1970	1.19E+07	0.069	1.85E-03	2.747	9.87E-04	0.040	1.614	0.029	1.89E+07	4.92E+05	1.94E+07
1971	1.57E+07	0.090	1.61E-03	3.535	1.83E-03	0.236	2.058	0.028	8.14E+06		8.14E+06
1972	1.59E+07	0.090	1.02E-03	6.565	1.86E-03	0.058	3.198	0.035	2.06E+07		2.06E+07
1973	7.87E+06	0.104	2.91E-02	4.651	1.44E-03	0.474	1.672	0.147	1.02E+07		1.02E+07
1974	6.53E+06	0.051	3.09E-02	3.349	1.92E-03	0.575	1.700	0.069	1.29E+07		1.29E+07
1975	5.00E+06	0.051	4.28E-03	2.414	4.99E-03	0.319	0.646	0.074	6.50E+06		6.50E+06
1976	1.47E+06	N/A	1.57E-03	0.717	0.00E+00	0.076	0.152	0.011	1.90E+06		1.90E+06
Totals	2.00E+08	3.61	13.86	2106.70	0.036	2.75	39.94	1.44	1.17E+08	6.44E+07	2.30E+08
Grand Total	4.31E+08										

Curies are uncorrected for decay.

APPENDIX F

FIRST CYCLE WASTE DISPOSAL TO

CRIBS AND TRENCHES

FIRST CYCLE WASTE DISPOSAL TO CRIBS AND TRENCHES

FIRST CYCLE WASTE DISPOSAL TO T TRENCHES									
Date	Trench	Tank	Liters	Pu (g)	U (g)	β (Ci)	^{137}Cs (Ci)	^{90}Sr (Ci)	Reference
1/15/54	T-14	T-104	4.60E+05	0.36	14500	547	230	1.01	HW-38562
1/22/54	T-14	T-105	5.46E+05	0.42	14700	437	229	4.75	HW-38562
1/29/54	T-15	T-105	9.15E+05	0.75	23300	686	403	20.1	HW-38562
2/4/54	T-15	T-106	1.27E+05	0.08	2850	108	610	1	HW-38562
2/10/54	T-16	T-106	1.02E+06	0.58	21400	878	510	8.67	HW-38562
2/13/54	T-17	T-106	3.48E+05	0.21	9400	278	157	0.42	HW-38562
6/10/54	T-17	T-106	4.37E+05	0.27	10100	367	208	2.54	HW-38562

FIRST CYCLE WASTE DISPOSAL TO TX TRENCHES									
Date	Trench	Tank	Liters	Pu (g)	U (g)	β (Ci)	^{137}Cs (Ci)	^{90}Sr (Ci)	Reference
6/24/54	T-21	TX-109	4.63E+05	1.25	521	7290	389	7.87	HW-38562
7/23/54	T-22	TX-110	1.54E+06	1.90	2170	3800	1850	49.3	HW-38562
7/30/54	T-23	TX-110	7.48E+05	0.21	842	935	591	16.5	HW-38562
8/6/54	T-23	TX-111	7.38E+05	0.66	244	2440	738	23.6	HW-38562
8/13/54	T-24	TX-111	1.54E+06	2.48	8320	4200	1420	38.5	HW-38562

FIRST CYCLE EVAPORATOR BOTTOMS DISPOSAL TO 216-T-25									
Date		Tank	Liters	Pu (g)	U (g)	β (Ci)	^{137}Cs (Ci)	^{90}Sr (Ci)	Reference
9/19/54		TY-101	2.48E+06	0.58	855	11000	7190	3.97	HW-38562
9/22/54		TY-102	5.07E+05	0.02	258	3240	1170	0.14	HW-38562
Total			2.99E+06	0.60	1113	14240	8360	4.11	HW-38562

FIRST CYCLE WASTE DISPOSAL TO CRIBS AND TRENCHES

SCAVENGED FIRST CYCLE WASTE DISPOSAL TO 216-T-26									
Date		Tank	Liters	Pu (g)	U (g)	β (Ci)	^{137}Cs (Ci)	^{90}Sr (Ci)	Reference
Aug-55		TY-104	2.07E+06	7.09	17700	3760	22.5	252	HW-44784
Aug-55		TY-103	1.65E+06	6.38	1560	6330	55	263	HW-44784
Oct-55		TY-101	1.92E+06	24.4	66900	5600	76.4	112	HW-44784
Dec-55		TY-103	2.00E+06	7.66	47900	6550	1.58	23.8	HW-44784
Nov-56		TY-101	2.11E+06	8.15	13200	5310	5.02	7.81	HW-48518
Nov-56		TY-103	1.33E+06	4.93	2560	1250	4.22	9.5	HW-48518
Total			1.11E+07	58.61	149820	28800	164.72	668.11	HW-48518

Curies are uncorrected for decay.

APPENDIX G

WASTE DISCHARGES TO TY CRIBS

WASTE DISCHARGES TO TY CRIBS

216-T-27 (340 Bldg. Waste)					
Date	Vol (L)	U (kg)	Pu (g)	β (Ci)	Reference
Sep-65	1.40E+06	0.2	3.4	620	ISO-98
Oct-65	3.96E+07	0.2	9.1	1254	ISO-98
Nov-65	8.00E+05	N/A	0.1	112	ISO-98
Dec-65	0.00	N/A	N/A	N/A	ISO-98
Totals	4.18E+07	0.4	12.6	1986	

Curies are uncorrected for decay.

There is a discrepancy regarding the amount of waste discharged to this crib. ISO-98 originally reported a discharge of 3.96E+07 L (1.05E+07 gal) in October. This is believed to be a typographical error, since the next report, ISO-698, listed the total amount discharged to the crib as 6.0E+06 L (1.6E+06 gal). If the amount for October were 3.96E+06 L (1.05E+06 gal), it would make the total 5.5E+06 L (1.45E+06 gal), similar to the 6.0E+06 L (1.6E+06 gal) reported in ISO-698. ARH-486 and later documents report a total discharge amount of 7.19E+06 L (1.9E+06 gal). There is no available report of another discharge. The 7.19E+06 value is assumed in Appendix A for conservatism.

216-T-28 (340 Bldg. Waste)					
Date	Vol (L)	U (kg)	Pu (g)	β (Ci)	Reference
Jan-60	0.00				HW-69071
Feb-60	8.80E+04	0.702	1.651	2.882	HW-69071
Mar-60	6.20E+04	4.545	0.000	6.787	HW-69071
Apr-60	1.60E+04	0.210	0.040	2.358	HW-69071
May-60	6.10E+04	2.504	0.143	1.738	HW-69071
Jun-60	1.79E+05	1.708	1.060	9.054	HW-69071
Jul-60	0.00	N/A	N/A	N/A	HW-69072
Aug-60	5.80E+04	3.122	0.019	13.848	HW-69072
Sep-60	6.70E+04	0.225	0.195	0.122	HW-69072
Oct-60	1.08E+05	0.962	0.223	1.757	HW-69072

WASTE DISCHARGES TO TY CRIBS

216-T-28 (340 Bldg. Waste)					
Date	Vol. (L)	U (kg)	Pu (g)	β (Ci)	Reference
Nov-60	6.70E+04	0.009	0.212	0.009	HW-69072
Dec-60	1.89E+05	1.575	0.357	4.303	HW-69072
Jan-61	6.00E+03	0.004	0.228	0.228	HW-71971
Feb-61	1.30E+05	8.014	0.175	11.224	HW-71971
Mar-61	2.28E+05	0.621	0.296	45.950	HW-71971
Apr-61	1.17E+05	2.980	0.147	5.318	HW-71971
May-61	8.40E+04	0.209	0.009	2.388	HW-71971
Jun-61	2.76E+05	1.989	0.375	16.622	HW-71971
Jul-61	1.55E+05	4.040	0.174	5.594	HW-72956
Aug-61	2.20E+05	2.429	2.902	13.188	HW-72956
Sep-61	2.04E+05	3.925	0.242	2.750	HW-72956
Oct-61	1.70E+05	1.045	0.103	76.944	HW-72956
Nov-61	2.92E+05	2.225	0.216	13.514	HW-72956
Dec-61	3.06E+05	1.736	1.055	9.169	HW-72956
Jan-62	2.10E+05	1.900	0.120	26	HW-76638
Feb-62	3.00E+05	9.600	0.310	150	HW-76638
Mar-62	3.30E+05	3.800	4.000	37	HW-76638
Apr-62	2.90E+05	9.400	5.640	512	HW-76638
May-62	6.00E+04	0.100	0.020	39	HW-76638
Jun-62	0.00	N/A	N/A	N/A	HW-76638
Jul-62	5.20E+05	6.900	0.300	821	HW-76638
Aug-62	0.00	N/A	N/A	N/A	HW-76638
Sep-62	3.50E+05	1.400	N/A	394	HW-76638
Oct-62	1.90E+05	1.900	N/A	88	HW-76638
Nov-62	0.00	N/A	N/A	N/A	HW-76638
Dec-62	4.00E+05	5.900	0.110	128	HW-76638
Jan-63	1.90E+05	2.420	0.036	241	HW-80877
Feb-63	1.20E+05	0.980	0.033	42	HW-80877

WASTE DISCHARGES TO TY CRIBS

Mar-63	0.00	N/A	N/A	N/A	HW-80877
Apr-63	2.90E+05	2.580	0.093	675	HW-80877
May-63	2.70E+05	3.570	0.326	185	HW-80877
Jun-63	1.90E+05	1.340	0.114	504	HW-80877
Jul-63	1.70E+05	0.720	0.044	2926	HW-80877
Aug-63	0.00	N/A	N/A	N/A	HW-80877
Sep-63	2.00E+05	2.020	0.052	134	HW-80877
Oct-63	1.70E+06	1.920	0.883	868	HW-80877
Nov-63	1.75E+06	1.570	1.575	1215	HW-80877
Dec-63	1.34E+06	0.200	37.000	126	HW-80877
Jan-64	1.80E+06	2.702	1.055	2186	BNWC-91
Feb-64	1.18E+06	0.468	0.067	41	BNWC-91
Mar-64	1.71E+06	6.110	1.731	4416	BNWC-91
Apr-64	1.10E+06	0.164	0.060	193	BNWC-91
May-64	1.76E+06	2.552	2.574	2062	BNWC-91
Jun-64	1.21E+06	1.660	0.341	2076	BNWC-91
Jul-64	1.14E+06	2.160	3.510	420	BNWC-91
Aug-64	1.20E+06	204.999	2.260	1495	BNWC-91
Sep-64	1.26E+06	26.850	1.363	4301	BNWC-91
Oct-64	1.06E+06	1.400	3.100	711	BNWC-91
Nov-64	1.25E+06	1.290	1.649	640	BNWC-91
Dec-64	1.86E+06	0.00	0.054	139	BNWC-91
Jan-65	1.30E+06	N/A	1.0	934	ISO-98
Feb-65	1.00E+06	N/A	7.4	200	ISO-98
Mar-65	2.30E+06	N/A	4.7	8427	ISO-98
Apr-65	2.10E+06	N/A	5.8	2335	ISO-98
May-65	1.10E+06	N/A	3.7	970	ISO-98
Jun-65	2.30E+06	N/A	0.3	1489	ISO-98
Jul-65	1.10E+06	N/A	1.4	957	ISO-98
Aug-65	1.80E+06	N/A	4.6	14940	ISO-98

WASTE DISCHARGES TO TY CRIBS

Sep-65	0.00	N/A	N/A	N/A	ISO-98
Oct-65	0.00	N/A	N/A	N/A	ISO-98
Nov-65	0.00	N/A	N/A	N/A	ISO-98
Dec-65	2.00E+05	N/A	1.1	124	ISO-98
Jan-66	3.20E+05	3.100	0.900	63.100	ISO-698
Jul-66	3.10E+05	4.790	0.100	91.500	ISO-698
Total	4.23E+07	361	109	58567	

Curies are uncorrected for decay.

APPENDIX H

WASTE DISCHARGES TO TRENCHES 216-T-34,

216-T-35, AND 216-T-36

**WASTE DISCHARGES TO TRENCHES 216-T-34,
216-T-35, AND 216-T-36**

216-T-34 DISCHARGE HISTORY (340 Bldg. Waste)										
Date	Vol (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	^{144}Ce (Ci)	Reference
May-66	8.33E+05	0.38	N/A	308	N/A	N/A	N/A	N/A	N/A	ISO-698
Jun-66	1.08E+06	0.06	0.00	393	N/A	N/A	N/A	N/A	N/A	ISO-698
Jul-66	5.30E+05	0.50	1.40	280	N/A	N/A	N/A	N/A	N/A	ISO-698
Aug-66	1.19E+06	0.50	94.50	3150	N/A	N/A	N/A	N/A	N/A	ISO-698
Sep-66	1.38E+06	0.60	4.70	4380	N/A	N/A	N/A	N/A	N/A	ISO-698
Oct-66	1.48E+06	0.06	2.00	3159	N/A	N/A	N/A	N/A	N/A	ISO-698
Nov-66	1.80E+06	0.35	4.75	665	N/A	N/A	N/A	N/A	N/A	ISO-698
Dec-66	1.67E+06	N/A	N/A	61	N/A	N/A	N/A	N/A	N/A	ISO-698
Jan-67	1.44E+06	0.22	0.48	755	1.49	0.51	1.55	N/A	N/A	ARH-486
Feb-67	1.31E+06	0.52	0.83	425	0.68	0.88	2.29	N/A	N/A	ARH-486
Mar-67	5.50E+05	0.20	0.87	61	0.16	1.52	1.23	N/A	N/A	ARH-486
Total (est.)	1.73E+07	4.12	107.20	26241	7.33	322.90	275.10	275.10	100	ARH-486

Curies are uncorrected for decay.

216-T-35 DISCHARGE HISTORY (340 Bldg. Waste)											
Date	Vol (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	^{144}Ce (Ci)	^{147}Pm (Ci)	Reference
Mar-67	7.19E+05	0.230	12.00	78.10	0.18	0.72	2.50	16.00	14.00	21.00	ARH-486
Apr-67	1.55E+06	48.000	2.60	96.00	1.50	2.00	5.60	19.00	92.00	34.00	ARH-486
May-67	7.57E+05	0.222	9.90	140.00	1.00	0.76	4.90	64.00	60.00	75.00	ARH-486
Jun-67	1.15E+06	0.127	20.00	164.00	0.43	6.20	4.10	20.00	44.00	23.00	ARH-486
Jul-67	5.30E+05	0.163	13.00	150.00	0.08	0.74	0.85	4.30	9.00	13.00	ARH-486
Aug-67	6.81E+05	0.077	2.60	96.00	0.06	0.05	1.10	2.90	8.60	0.51	ARH-486
Sep-67	1.89E+05	0.054	1.00	119.00	0.13	0.03	0.43	2.10	9.50	7.67	ARH-486
Oct-67	0.00										ARH-486
Nov-67	3.80E+04	0.011	4.80	2.80	0.00	0.03	0.09	0.25	0.49	0.79	ARH-486
Dec-67	0.00										ARH-486

**WASTE DISCHARGES TO TRENCHES 216-T-34,
216-T-35, AND 216-T-36**

216-T-35 DISCHARGE HISTORY (340 Bldg. Waste)											
Date	Vol (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	^{144}Ce (Ci)	^{147}Pm (Ci)	Reference
Jan-68	1.14E+05	0.006	0.30	83.00	0.03	9.50	0	1.77	7.30	84.00	ARH-1159
Total	5.73E+06	48.890	66.20	928.90	3.42	20.03	19.98	130.32	244.89	258.97	

Curies are uncorrected for decay.

216-T-36 DISCHARGE HISTORY (221-T Decontamination Waste)												
Date	Vol (L)	U (kg)	Pu (g)	β (Ci)	^{60}Co (Ci)	^{90}Sr (Ci)	^{137}Cs (Ci)	^{106}Ru (Ci)	^{144}Ce (Ci)	^{147}Pm (Ci)	^{125}Sb (Ci)	Reference
May-67	6.70E+04	0.208	0.200	30.70	0.002	0.37	0.62	2.05	3.40	1.10	0.25	ARH-486
Jun-67	1.10E+05	0.240	0.040	9.57	0.160	4.97	1.60	36.32	24.40	7.91	0.50	ARH-486
Jul-67	5.30E+04	0.001	0.002	21.00	0.001	0.74	0.15	0.48	1.14	3.00	0.06	ARH-486
Aug-67	1.06E+05	0.104	1.610	26.80	0.038	1.43	1.35	3.52	17.90	7.23	0.44	ARH-486
Sep-67	0.00											ARH-486
Oct-67	0.00											ARH-486
Nov-67	3.50E+04	0.136	0.600	4.10	0.002	0.10	0.70	1.78	0.10	0.81	N/A	ARH-486
Dec-67	0.00											ARH-486
Oct-68	5.07E+04	0.121	0.003	0.91	0.07	0.08	0.50	0.11	0.05	0.27	N/A	ARH-1159
Dec-68	5.07E+04	0.241	0.028	0.10	0.24	0.02	1.40	1.60	0.32	0.25	N/A	ARH-1159
Jan-69	5.07E+04	0.127	0.001	0.28	0.00	0.00	0.10	0.22	N/A	N/A	N/A	ARH-1608
Total	5.23E+05	1.178	2.48	93.46	0.52	7.72	6.42	46.08	47.31	20.57	1.25	

Curies are uncorrected for decay.

APPENDIX I

WASTE DISCHARGES TO 231-Z CRIBS

WASTE DISCHARGES TO 231-Z CRIBS

231-W CRIB DISCHARGE SUMMARY									
Crib	Volume (L)	Pu (g)	U (kg)	β (Ci)	^{90}Sr (Ci)	^{106}Ru (Ci)	^{137}Cs (Ci)	^{60}Co (Ci)	Reference
216-Z-10	9.84E+05	50	N/A	N/A	N/A	N/A	N/A	N/A	HW-17088
216-Z-4	1.10E+04	2	0.05	2.5	0.1	1.0	0.1	0.1	ARH-231
216-Z-6	9.80E+04	5	0.05	2.5	0.1	1.0	0.1	1.0	ARH-231
216-Z-5	2.68E+07	340	0.05	14.5	2.4	1.36E-07	5.05	9.72E-03	HW-17088

Curies are uncorrected for decay.

There is a discrepancy regarding the amount of waste discharged to crib 216-Z-5, which operated from 1945 to 1947. Brown and Ruppert (1948), Patterson (1949), and Brown and Ruppert (1950) state that 2.68E+07 L (7.1E+06 gal) were discharged to this crib. Sloat (1967) estimates that 3.10E+07 L (8.2E+06 gal) were discharged. This value has been carried over into Hanson et. al (1973), Anderson (1976), Owens (1980), Maxfield (1979), and WIDS. No record of another 4.2E+06-L (1.1E+06-gal) discharge has been located, however, 3.1E+07 L (8.2E+06 gal) is assumed in Appendix A for conservatism. Another discrepancy involves the amount of waste discharged to 216-Z-10, which is usually described as 1.0E+06 L (2.6E+05 gal). This is believed to be roundoff error.

There is a large discrepancy regarding the volume of waste discharged to crib 216-Z-7. All crib discharge records up to and including McMurray (1967) record the total volume as 4.81E+07 L (1.3E+07 gal). However, Sloat (1967) estimates that 8.0E+07 L (2.1E+07 gal) were discharged, even though McMurray (1967) is cited as a reference. This is carried over to subsequent reports. The yearly volumes for the years 1949-1957 are first given in Hanson, et. al (1973), and differ widely from all previously reported discharge volumes. It is believed that the correct volume is 4.8E+07 L (1.3E+07 gal).

CRIB 216-Z-7 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
1947	1.04E+07	10.5	N/A	Original records
Jan-48	1.02E+06	1.0	N/A	Original records
Feb-48	9.15E+05	1.4	N/A	Original records
Mar-48	9.70E+05	0.5	N/A	Original records
Apr-48	1.00E+06	0.9	N/A	Original records
May-48	1.13E+06	1.9	N/A	Original records

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-7 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Jun-48	1.15E+06	2.0	N/A	Original records
Jul-48	1.26E+06	1.2	N/A	Original records
Aug-48	1.26E+06	2.0	N/A	Original records
Sep-48	1.02E+06	2.8	N/A	Original records
Oct-48	9.55E+05	2.9	N/A	Original records
Nov-48	1.15E+06	4.6	N/A	Original records
Dec-48	9.60E+05	4.0	N/A	Original records
Jan-49	8.48E+05	3.0	N/A	Original records
Feb-49	7.55E+05	2.4	N/A	Original records
Mar-49	1.09E+06	6.9	N/A	Original records
Apr-49	7.43E+05	3.7	N/A	Original records
May-49	8.47E+05	2.3	N/A	Original records
Jun-49	8.34E+05	1.9	N/A	Original records
Jul-49	7.10E+05	1.7	N/A	Original records
Aug-49	3.59E+05	3.3	N/A	Original records
Sep-49	3.73E+05	3.30	N/A	HW-20583
Oct-49	3.20E+05	2.90	N/A	HW-20583
Nov-49	3.10E+05	2.40	N/A	HW-20583
Dec-49	3.60E+05	2.20	N/A	HW-20583
Jan-50	4.90E+05	5.70	N/A	HW-20583
Feb-50	5.10E+05	2.80	N/A	HW-20583
Mar-50	3.70E+05	6.10	N/A	HW-20583
Apr-50	4.70E+05	1.60	N/A	HW-20583
May-50	3.80E+05	1.70	N/A	HW-20583
Jun-50	3.20E+05	1.90	N/A	HW-20583
Jul-50	4.20E+05	2.00	N/A	HW-20583
Aug-50	5.60E+05	6.20	N/A	HW-20583
Sep-50	4.70E+05	1.70	N/A	HW-20583

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-7 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Oct-50	3.60E+05	2.60	N/A	HW-20583
Nov-50	3.20E+05	4.20	N/A	HW-20583
Dec-50	5.40E+05	3.20	N/A	HW-20583
Jan-51	5.25E+05	2.72	N/A	Original records
Feb-51	3.68E+05	2.80	N/A	Original records
Mar-51	3.43E+05	4.51	N/A	Original records
Apr-51	3.10E+05	2.90	N/A	Original records
May-51	2.90E+05	5.32	N/A	Original records
Jun-51	1.89E+05	4.28	N/A	Original records
Jul-51	1.72E+05	8.58	N/A	Original records
Aug-51	2.10E+05	3.80	N/A	Original records
Sep-51	1.71E+05	2.48	N/A	Original records
Oct-51	2.20E+05	9.14	N/A	Original records
Nov-51	1.97E+05	8.00	N/A	Original records
Dec-51	1.79E+05	4.04	N/A	Original records
Jan-52	1.63E+05	5.50	N/A	HW-25301
Feb-52	8.30E+04	2.10	N/A	HW-25301
Mar-52	8.60E+04	1.30	N/A	HW-25301
Apr-52	9.60E+04	3.10	N/A	HW-25301
May-52	2.04E+05	2.70	N/A	HW-25301
Jun-52	1.24E+05	4.50	N/A	HW-25301
Jul-52	9.90E+04	0.53	N/A	HW-33591
Aug-52	8.10E+04	0.90	N/A	HW-33591
Sep-52	5.10E+04	6.60	N/A	HW-33591
Oct-52	4.50E+04	1.10	N/A	HW-33591
Nov-52	5.30E+04	0.88	N/A	HW-33591
Dec-52	6.70E+04	1.01	N/A	HW-33591
Jan-53	2.50E+04	3.00	N/A	HW-33591

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-7 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Feb-53	9.20E+04	4.80	N/A	HW-33591
Mar-53	9.10E+04	1.10	N/A	HW-33591
Apr-53	7.30E+04	0.19	N/A	HW-33591
May-53	8.40E+04	0.23	N/A	HW-33591
Jun-53	4.80E+04	0.91	N/A	HW-33591
Jul-53	5.50E+04	49.80	N/A	HW-33591
Aug-53	5.60E+04	3.74	N/A	HW-33591
Sep-53	2.30E+04	5.46	N/A	HW-33591
Oct-53	2.60E+04	0.69	N/A	HW-33591
Nov-53	2.30E+04	0.49	N/A	HW-33591
Dec-53	1.90E+04	0.14	N/A	HW-33591
Jan-54	1.40E+04	0.14	N/A	HW-33591
Feb-54	2.80E+04	0.41	N/A	HW-33591
Mar-54	1.60E+04	0.11	N/A	HW-33591
Apr-54	2.40E+04	0.23	N/A	HW-33591
May-54	1.00E+04	0.16	N/A	HW-33591
Jun-54	1.20E+04	0.22	N/A	HW-33591
Jul-54	7.00E+04	0.26	N/A	HW-38562
Aug-54	3.00E+02	0.06	N/A	HW-38562
Sep-54	5.40E+03	0.13	N/A	HW-38562
Oct-54	8.80E+03	1.03	N/A	HW-38562
Nov-54	9.90E+03	0.54	N/A	HW-38562
Dec-54	9.90E+03	0.27	N/A	HW-38562
Jan-55	1.85E+04	9.77	N/A	HW-38562
Feb-55	1.93E+04	22.4	N/A	HW-38562
Mar-55	2.16E+04	1.03	N/A	HW-38562
Apr-55	4.07E+04	7.27	N/A	HW-38562
May-55	2.59E+04	8.24	N/A	HW-38562
Jun-55	3.04E+04	4.30	N/A	HW-38562

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-7 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Jul-55	3.03E+04	0.57	N/A	HW-44784
Aug-55	2.58E+04	0.17	N/A	HW-44784
Sep-55	2.38E+04	1.03	N/A	HW-44784
Oct-55	3.41E+04	25.90	N/A	HW-44784
Nov-55	5.76E+03	0.39	N/A	HW-44784
Dec-55	2.16E+04	8.33	N/A	HW-44784
Jan-56	4.73E+04	0.12	N/A	HW-44784
Feb-56	6.62E+03	0.04	N/A	HW-44784
Mar-56	6.55E+03	0.05	N/A	HW-44784
Apr-56	1.85E+05	0.05	N/A	HW-44784
May-56	2.20E+04	0.75	N/A	HW-44784
Jun-56	1.66E+04	0.16	N/A	HW-44784
Jul-56	6.94E+03	0.08	N/A	HW-48518
Aug-56	9.14E+03	1.10	N/A	HW-48518
Sep-56	1.51E+04	0.22	N/A	HW-48518
Oct-56	9.58E+03	0.22	N/A	HW-48518
Nov-56	1.85E+04	0.65	N/A	HW-48518
Dec-56	1.15E+04	0.30	N/A	HW-48518
Jan-57	2.14E+04	0.40	N/A	HW-53336
Feb-57	0.00	0.00	N/A	HW-53336
Mar-57	0.00	0.00	N/A	HW-53336
Apr-57	0.00	0.00	N/A	HW-53336
May-57	2.75E+03	0.03	N/A	HW-53336
Jun-57	0.00	0.00	N/A	HW-53336
Nov-65	7.00E+05	0.10	111	ISO-98
Dec-65	1.20E+06	0.10	98	ISO-98
Jan-66	1.36E+06	0.10	104	ISO-698
Feb-66	9.65E+05	0.40	433	ISO-698
Mar-66	5.96E+05	2.32	864	ISO-698

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-7 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Apr-66	8.33E+05	0.55	195	ISO-698
May-66	6.62E+05	N/A	78	ISO-698
Totals	4.81E+07	371		

Curies are uncorrected for decay.

CRIB 216-Z-17 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Jan-67	0.00	N/A	N/A	ARH-486
Feb-67	1.36E+06	1.10	0.001	ARH-486
Mar-67	2.12E+06	1.80	0.002	ARH-486
Apr-67	2.96E+06	38.00	0.003	ARH-486
May-67	3.26E+06	2.20	0.06	ARH-486
Jun-67	2.97E+06	0.52	0.16	ARH-486
Jul-67	3.15E+06	0.44	0.28	ARH-486
Aug-67	2.71E+06	1.10	0.02	ARH-486
Sep-67	2.96E+06	1.10	0.09	ARH-486
Oct-67	3.07E+06	1.40	0.02	ARH-486
Nov-67	3.01E+06	0.18	0.16	ARH-486
Dec-67	3.07E+06	1.40	0.003	ARH-486
Jan-68	3.09E+06	0.64	0.13	ARH-1159
Feb-68	3.02E+06	0.31	0.11	ARH-1159
Totals	3.67E+07	50.19	1.039	

Curies are uncorrected for decay.

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-16 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Mar-68	2.69E+05	0.002	9.00E-04	ARH-1159
Apr-68	1.35E+06	0.069	0.040	ARH-1159
May-68	1.44E+06	0.242	0.105	ARH-1159
Jun-68	1.21E+06	0.047	0.007	ARH-1159
Jul-68	1.67E+06	0.041	0.007	ARH-1159
Aug-68	1.65E+06	0.141	0.004	ARH-1159
Sep-68	1.97E+06	0.168	0.016	ARH-1159
Oct-68	1.70E+06	0.074	0.006	ARH-1159
Nov-68	1.83E+06	0.134	0.007	ARH-1159
Dec-68	2.30E+06	0.284	0.009	ARH-1159
Jan-69	1.36E+06	0.068	0.005	ARH-1608
Feb-69	1.42E+06	0.061	0.006	ARH-1608
Mar-69	1.63E+06	0.076	0.006	ARH-1608
Apr-69	1.62E+06	0.913	0.033	ARH-1608
May-69	1.65E+06	0.082	0.006	ARH-1608
Jun-69	2.17E+06	2.070	0.016	ARH-1608
Jul-69	1.81E+06	0.885	0.033	ARH-1608
Aug-69	2.00E+06	0.228	0.011	ARH-1608
Sep-69	1.59E+06	0.102	0.006	ARH-1608
Oct-69	1.82E+06	0.058	0.006	ARH-1608
Nov-69	2.31E+06	0.347	0.009	ARH-1608
Dec-69	2.00E+06	0.288	0.007	ARH-1608
Jan-70	1.36E+06	0.044	0.005	ARH-2015
Feb-70	1.36E+06	0.019	0.005	ARH-2015
Mar-70	1.70E+06	0.022	0.006	ARH-2015
Apr-70	1.63E+06	0.050	0.008	ARH-2015
May-70	2.08E+06	1.420	0.027	ARH-2015
Jun-70	1.59E+06	0.786	0.005	ARH-2015

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-16 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Jul-70	1.42E+06	0.124	0.003	ARH-2015
Aug-70	1.90E+06	0.073	0.002	ARH-2015
Sep-70	1.48E+06	0.108	0.003	ARH-2015
Oct-70	1.47E+06	0.092	0.002	ARH-2015
Nov-70	1.89E+06	0.260	0.006	ARH-2015
Dec-70	1.28E+06	0.101	0.005	ARH-2015
Jan-71	1.36E+06	0.569	0.003	ARH-2353
Feb-71	1.36E+06	0.382	0.016	ARH-2353
Mar-71	1.51E+06	0.532	0.003	ARH-2353
Apr-71	1.59E+06	0.395	0.017	ARH-2353
May-71	1.55E+06	0.525	0.035	ARH-2353
Jun-71	2.27E+06	0.255	0.004	ARH-2353
Jul-71	1.51E+06	0.276	0.003	ARH-2353
Aug-71	1.59E+06	0.218	0.036	ARH-2353
Sep-71	1.86E+06	0.456	0.017	ARH-2353
Oct-71	1.59E+06	0.244	0.015	ARH-2353
Nov-71	1.48E+06	0.936	7.18E-04	ARH-2353
Dec-71	1.36E+06	2.434	0.015	ARH-2353
Jan-72	6.93E+05	0.260	0.012	ARH-2757
Feb-72	6.10E+05	0.177	0.001	ARH-2757
Mar-72	7.98E+05	0.165	0.001	ARH-2757
Apr-72	8.54E+05	1.610	0.009	ARH-2757
May-72	8.33E+05	9.660	0.050	ARH-2757
Jun-72	7.95E+05	35.700	0.122	ARH-2757
Jul-72	1.06E+06	0.173	1.17E-03	ARH-2757
Aug-72	7.71E+05	0.140	9.25E-04	ARH-2757
Sep-72	6.34E+05	0.102	6.10E-04	ARH-2757
Oct-72	1.06E+06	0.211	0.001	ARH-2757
Nov-72	8.14E+05	0.398	0.002	ARH-2757

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-16 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
Dec-72	8.33E+05	0.057	4.33E-04	ARH-2757
Jan-73	1.37E+06	4.310	0.139	ARH-2806
Feb-73	1.50E+06	0.800	0.027	ARH-2806
Mar-73	1.37E+06	0.903	0.029	ARH-2806
Apr-73	1.37E+06	0.049	0.002	ARH-2806
May-73	1.34E+06	0.074	0.004	ARH-2806
Jun-73	4.54E+05	0.016	0.001	ARH-2806
Jul-73	3.07E+05	0.003	1.21E-04	ARH-2806
Aug-73	3.10E+05	0.008	3.02E-04	ARH-2806
Sep-73	5.26E+05	0.008	1.07E-04	ARH-2806
Oct-73	3.06E+05	0.069	3.82E-04	ARH-2806
Nov-73	2.19E+05	0.001	4.28E-05	ARH-2806
Dec-73	2.54E+05	0.006	5.16E-05	ARH-2806
Jan-74	2.68E+05	0.384	2.36E-03	ARH-3093
Feb-74	2.80E+05	0.003	8.82E-05	ARH-3093
Mar-74	3.80E+05	0.005	2.00E-04	ARH-3093
Apr-74	2.01E+05	0.009	1.12E-04	ARH-3093
May-74	3.39E+05	0.014	1.18E-04	ARH-3093
Jun-74	3.13E+05	0.032	1.41E-04	ARH-3093
Jul-74	2.23E+05	0.034	8.96E-04	ARH-3093
Aug-74	2.26E+05	0.001	3.82E-05	ARH-3093
Sep-74	3.47E+05	0.029	3.55E-04	ARH-3093
Oct-74	2.18E+05	0.001	1.01E-04	ARH-3093
Nov-74	2.44E+05	1.64E-04	1.38E-04	ARH-3093
Dec-74	2.59E+05	0.008	1.66E-04	ARH-3093
Jan-75	2.30E+05	0.002	7.16E-05	ARH-CD-371
Feb-75	3.88E+05	0.019	2.34E-04	ARH-CD-371
Mar-75	2.68E+05	0.003	1.41E-04	ARH-CD-371
Apr-75	1.51E+05	1.74E-04	3.26E-05	ARH-CD-371

WASTE DISCHARGES TO 231-Z CRIBS

CRIB 216-Z-16 DISCHARGE HISTORY				
Date	Vol (L)	Pu (g)	β (Ci)	Reference
May-75	2.56E+05	3.28E-04	4.44E-05	ARH-CD-371
Jun-75	4.03E+05	0.015	1.72E-04	ARH-CD-371
Jul-75	2.65E+05	8.08E-04	5.48E-05	ARH-CD-371
Aug-75	3.13E+05	4.48E-04	6.81E-05	ARH-CD-371
Sep-75	2.63E+05	5.36E-04	5.22E-05	ARH-CD-371
Oct-75	1.53E+05	3.25E-04	4.92E-05	ARH-CD-371
Nov-75	1.82E+05	0.228	9.19E-05	ARH-CD-371
Dec-75	2.25E+05	0.003	3.40E-05	ARH-CD-371
Jan-76	1.45E+05	0.035	7.13E-05	ARH-CD-743
Feb-76	2.05E+05	0.004	4.86E-05	ARH-CD-743
Mar-76	2.75E+05	0.007	3.98E-05	ARH-CD-743
Apr-76	1.16E+05	0.005	7.09E-05	ARH-CD-743
May-76	1.93E+05	0.004	9.42E-05	ARH-CD-743
Jun-76	0.00	N/A	N/A	ARH-CD-743
Jul-76	3.86E+04	0.003	1.53E-05	ARH-CD-743
Aug-76	4.62E+04	0.000	1.03E-04	ARH-CD-743
Sep-76	2.16E+05	0.015	8.57E-05	ARH-CD-743
Oct-76	1.25E+05	0.009	4.95E-05	ARH-CD-743
Nov-76	1.19E+05	0.008	4.71E-05	ARH-CD-743
Dec-76	1.23E+05	0.009	4.88E-05	ARH-CD-743
Jan-77	7.63E+04	N/A	N/A	RHO-CD-34
Totals	1.02E+08	72.491	0.996	

Curies are uncorrected for decay.

APPENDIX J
TEST WELLS SURROUNDING T, TX,
AND TY TANK FARMS

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
216-T-5	299-W10-1	224-T-4	A7136	"43,550.0 "	"76,210.0"	136734.4	566663.2	8	306.0	93.3	8/31/47	XXX	
216-T-36	299-W10-2	224-T-10	A4896	"43,154.0 "	"76,183.0"	136613.7	566671.7	4	229.0	69.8	12/31/51	XXX	
216-T-36	299-W10-4	241-T-16	A7137	"43,033.0 "	"75,977.0"	136577.0	566734.6	8	245.0	74.7	11/30/52	XXX	
241-TY FARM	299-W10-5	241-T-20	A4898	"42,669.0 "	"76,489.0"	136465.7	566578.8	8	240.0	73.2	4/30/54		
241-TY FARM	299-W10-6		A7138	"42,670.0 "	"76,095.0"	136466.3	566698.9	6	220.0	67.1			
241-TY FARM	299-W10-7		A7139	"42,670.0 "	"75,615.0"	136466.7	566845.2	6	220.0	67.1			
241-T- FARM	299-W10-8	50-00-01	A4899	"43,799.0 "	"75,600.0"	136810.7	566848.9	6	252.0	76.8	6/1/73	XXX	Screen 211-251
241-T- FARM	299-W10-9		A4900	"43,760.0 "	"75,930.0"	136798.6	566748.3	6	225.0	68.6	10/31/73	XXX	Screen 200-220 ft
241-T- FARM	299-W10-10		A4887	"43,783.0 "	"75,920.0"	136805.6	566751.4	6	250.0	76.2	7/31/74	XXX	
241-T- FARM	299-W10-11		A4888	"43,771.0 "	"75,908.0"	136802.0	566755.0	6	250.0	76.2	6/30/74	XXX	
241-T- FARM	299-W10-12		A4889	"43,755.0 "	"75,906.0"	136797.1	566755.6	6	250.0	76.2	6/30/74	XXX	
241-T- FARM	299-W10-15		A4892	"43,790.7 "	"75,857.5"	136808.0	566770.4	4	222.0	67.7	11/30/89	XXX	
216-T-36	299-W10-16		A4893	"43,129.6 "	"75,824.6"	136606.6	566780.9	4	219.0	66.8	10/31/89	XXX	
216-T-13	299-W10-17		A4894	"42,751.0 "	"75,844.0"	136491.2	566775.3	4	222.9	67.9	1/31/91	XXX	
216-TY- CRIBS	299-W10-18		A4895	"42,439.0 "	"75,610.0"	136396.3	566846.9	4	222.6	67.8	12/31/90	XXX	

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
216-T-4	299-W10-19			"44,545.4 "	"77,248.7"	137037.0	566345.8	4	238.0	72.5	7/31/92	XXX	Also ECN 199402
216-T-14	229-W10-22		A9890	"44,036.4 "	"75,652.7"	136883.1	566832.6	4	245.5	74.8	11/16/94	XXX	New RCRA Well
241-T-FARM	299-W10-23		B8545	"43,814.3 "	"75,682.4"	136815.3	566823.7	4	272.0	82.9	8/15/98	XXX	
241-T-FARM	299-W10-24		B8546	"43,759.4 "	"75,480.1"	136798.8	566885.4	4	432.5	131.8	10/21/98	XXX	
216-T-26	299-W10-26		B8548	"42,453.2 "	"75,621.3"	136400.6	566843.4	4	262.0	79.9	8/25/98	XXX	
216-T-7	299-W10-70	"221-T-11, 241-T-11"	A7160	"43,342.0 "	"76,272.0"	136671.0	566644.4	8	150.0	45.7	8/31/47		
216-T-7	299-W10-71	"221-T-12, 241-T-12"	A7161	"43,285.0 "	"76,317.0"	136653.6	566630.7	8	150.0	45.7	8/31/47		
216-T-7	299-W10-72	"221-T-13, 241-T-13"	A7162	"43,270.0 "	"76,160.0"	136649.1	566678.6	8	150.0	45.7	8/31/47		
216-T-7	299-W10-78	241-TSW-3	A7168	"43,270.0 "	"76,236.0"	136649.0	566655.4	8	25.0	7.6	12/31/48		
216-T-7	299-W10-79	241-TSW-4	A7169	"43,315.0 "	"76,251.0"	136662.7	566650.8	8	25.0	7.6	12/31/48		
216-T-5	299-W10-189		A7268	"43,537.0 "	"76,186.0"	136730.5	566670.5	6	37.0	11.3	2/28/85		
216-T-5	299-W10-190		A7269	"43,526.0 "	"76,186.0"	136727.1	566670.5	6	20.0	6.1	2/28/85		
216-T-5	299-W10-191		A7270	"43,547.0 "	"76,185.0"	136733.5	566670.8	6	20.0	6.1	2/28/85		
216-T-6	299-W11-1	361-T-12	A7275	"43,274.0 "	"74,378.0"	136651.7	567221.7	8	314.0	95.7	3/31/50		
241-T-361	299-W11-7	361-T-19	A4910	"43,350.0 "	"74,251.0"	136674.9	567260.3	8	315.0	96.0	9/30/51		

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
				"									
216-T-118	299-W11-11	241-T-17	A7280	"42,632.0"	"75,274.0"	136455.3	566949.1	8	248.0	75.6	3/31/53		
241-T-152	299-W11-12	241-T-18	A4902	"43,098.0"	"75,340.0"	136597.3	566928.6	8	250.0	76.2	12/31/53	XXX	
216-TY-CRIBS	299-W11-13		A5465	"42,529.0"	"74,781.0"	136424.3	567099.4	8	498.0	151.8	7/31/61		Piesometers set 5/65 & 4/63
216-TY-CRIBS	299-W11-13O		A9468	"42,529.0"	"74,781.0"	136424.3	567099.4	1.5	498.0	151.8	5/31/65		
216-TY-CRIBS	299-W11-13P		A9469	"42,529.0"	"74,781.0"	136424.3	567099.4	1.5	498.0	151.8	4/30/63		
216-TY-CRIBS	299-W11-13Q		A9470	"42,529.0"	"74,781.0"	136424.3	567099.4	1.5	498.0	151.8	4/30/63		
216-T-3	299-W11-22	241-T-361	A9794	"43,345.00"	"74,225.00"	136673.4	567268.3	12/10/	325	99.1	8/10/44		T-Plant Reverse Well
216-T-14	299-W11-23		A4905	"43,766.00"	"75,416.00"	136800.8	566905.0	6	252	76.8	7/24/73	XXX	Screen 200-240
216-T-14	299-W11-24		A4906	"43,582.8"	"75,416.3"	136745.0	566905.0	6	250.0	76.2	8/31/73	XXX	Screen 210-250 ft
207-T	299-W11-26	DH-6	A7287	"42,986.0"	"74,959.0"	136563.5	567044.8	3.5	515.0	157.0	4/30/76		
216-T-14	299-W11-27		A4907	"43,751.5"	"75,482.7"	136796.4	566884.6	4	235.0	71.6	11/31/91	XXX	
207-T	299-W11-28		A4908	"43,577.8"	"75,319.3"	136743.5	566934.6	10/8/6/4	247.4	75.4	12/27/91	XXX	
Bio-Rem-Area	299-W11-29		A7288	"43,930.8"	"74,483.3"	136851.8	567189.1	4	279.3	85.1	4/24/92		
Bio-Rem-Area	299-W11-30		A7289	"43,953.4"	"74,470.2"	136858.7	567193.1	4	285.7	87.1	4/156/92		
Bio-Rem-Area	299-W11-31		A5472	"45,188.4"	"74,374.6"	137235.1	567221.3	4	267.0	81.4	3/31/92	XXX	

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
Bio-Rem-Area	299-W11-32		A7290	"43,940.7"	"74,477.9"	136854.8	567190.7	8	297.8	90.8	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-33		A9827	"43,906.6"	"74,497.2"	136844.4	567184.9	4	289.2	88.1	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-33P		B2401	"43,906.6"	"74,497.2"	136844.4	567184.9			0.0	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-33Q		B2402	"43,906.6"	"74,497.2"	136844.4	567184.9			0.0	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-34		A9826	"43,922.4"	"74,487.9"	136849.2	567187.7	4	310.0	94.5	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-34P		B2403	"43,922.4"	"74,487.9"	136849.2	567187.7		300.4	91.6	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-34Q		B2404	"43,922.4"	"74,487.9"	136849.2	567187.7		310.0	94.5	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-35		A9924	"43,914.5"	"74,492.4"	136846.8	567186.3	4	306.0	93.3	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-35P		B2406	"43,914.5"	"74,492.4"	136846.8	567186.3		294.6	89.8	6/10/96		New RCRA Well
Bio-Rem-Area	299-W11-35Q		B2405	"43,914.5"	"74,492.4"	136846.8	567186.3		306.0	93.3	6/10/96		New RCRA Well
216-T-6	299-W11-54	361-T-2	A7296	"43,307.0"	"74,466.0"	136661.7	567194.8	8	150.0	45.7	5/31/47		
216-T-6	299-W11-55	361-T-1	A7297	"43,333.0"	"74,450.0"	136669.6	567199.7	8	150.0	45.7	6/30/47		
216-T-6	299-W11-56	361-T-3	A7298	"43,307.0"	"74,434.0"	136661.7	567204.6	8	150.0	45.7	6/30/47		
216-T-6	299-W11-57	361-T-4	A7299	"43,343.0"	"74,450.0"	136672.7	567199.7	8	163.0	49.7	3/31/51		
216-T-6	299-W11-58	361-T-5	A7300	"43,301.0"	"74,474.0"	136659.8	567192.4	8	75.0	22.9	6/30/47		

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
216-T-6	299-W11-59	361-T-7	A7301	"43,291.0"	"74,408.0"	136656.8	567212.5	8	90.0	27.4	7/31/47		
216-T-6	299-W11-60	361-T-8	A7302	"43,315.0"	"74,543.0"	136664.1	567171.4	8	150.0	45.7	7/31/47		
216-T-6	299-W11-61	361-T-9	A7303	"43,296.0"	"74,483.0"	136658.3	567189.7	8	85.0	25.9	7/31/47		
216-T-6	299-W11-62	361-T-6	A7304	"43,301.0"	"74,426.0"	136659.9	567207.0	8	102.0	31.1	8/31/47		
216-T-6	299-W11-63	361-T-10	A7305	"43,277.0"	"74,450.0"	136652.5	567199.7	8	160.0	48.8	9/30/47		
216-T-6	299-W11-64	361-T-11	A7306	"43,339.0"	"74,436.0"	136671.4	567204.0	8	75.0	22.9	9/30/47		
216-T-6	299-W11-65	361-T-13	A7307	"43,244.0"	"74,450.0"	136642.5	567199.8	8	160.0	48.8	10/31/47		
216-T-6	299-W11-66	361-T-20	A7308	"43,282.0"	"74,506.0"	136654.0	567182.7	8	75.0	22.9	8/31/51		
216-T-6	299-W11-67	361-T-21	A7309	"43,244.0"	"74,374.0"	136642.5	567222.9	8	76.0	23.2	8/31/51		
216-T-14	299-W11-68	241-T-137	A7310	"43,880.0"	"75,335.0"	136835.6	566929.6	8	100.0	30.5	10/31/53		
216-T-115	299-W11-69	241-T-138	A7311	"43,705.0"	"75,200.0"	136782.4	566970.8	8	105.0	32.0	9/30/53		
216-T-26	299-W11-70	241-TY-7	A7312	"42,424.7"	"75,330.2"	136392.1	566932.1	8	150.0	45.7	5/31/55		"Deepened 1/83, 6'" Casing, Grouted"
216-T-3	299-W11-71	221-T-1 241-T-361-A	A7313	"43,334.5 0"	"74,249.75"	136670.2	567260.7	12/10/08	206	62.8	10/30/44		Covered Over Reverse Well
241-T-361	299-W11-79		A7321	"43,323.0"	"74,225.0"	136666.7	567268.3	6	150.0	45.7	3/7/83		Grouted
216-T-16	299-W11-80		A7322	"43,998.0"	"75,115.0"	136871.8	566996.5	8	50.0	15.2	10/11/82		"Grouted,(surface seal & bottom)"

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
216-T-17	299-W11-81		A7323	"43,768.0 "	"75,025.0"	136801.7	567024.1	8	50.0	15.2	10/12/82		"Grouted,(surface seal & bottom)"
216-T-26	299-W11-82		A7324	"42,475.0 "	"75,325.0"	136407.5	566933.8	8	70.0	21.3	1/14/83		"Grouted,(surface seal & bottom)"
216-T-28	299-W14-1	241-T-19	A4913	"42,159.1 "	"75,261.5"	136311.2	566953.3	8	240.0	73.2	1/31/54	XXX	"6"" Liner to 158 ft, Grouted"
216-T-28	299-W14-2	241-TY-5	A7328	"42,254.0 "	"75,289.0"	136340.1	566944.8	8	223.0	68.0	5/31/55	XXX	"6"" Liner to 158 ft, Grouted"
216-T-28	299-W14-3		A7329	"42,263.4 "	"75,303.6"	136343.0	566940.4	8	269.0	82.0	12/31/61	XXX	"6"" Liner to 157 ft, Grouted"
216-T-28	299-W14-3O		A7329	"42,263.4 "	"75,303.6"	136343.0	566940.4	8	269.0	82.0	12/31/61		Piezometer Removed 5/83
216-T-28	299-W14-3P		A7329	"42,263.4 "	"75,303.6"	136343.0	566940.4	8	269.0	82.0	12/31/61		Piezometer Removed 5/83
216-T-28	299-W14-4	299-W14-2A	A7330	"42,282.8 "	"75,368.5"	136348.8	566920.6	6	205.0	62.5	7/31/66		"5"" Liner to 140 ft, Grouted"
216-T-19	299-W14-5		A5475	"41,160.0 "	"75,440.0"	136006.6	566899.6	6	240.0	73.2	10/31/74	XXX	
216-T-19	299-W14-6		A7331	"41,360.0 "	"75,440.0"	136067.6	566899.5	6	240.0	73.2	12/31/74	XXX	
216-T-28	299-W14-12		A4914	"42,070.0 "	"75,418.9"	136284.2	566905.7	4	222.5	67.8	11/4/91	XXX	
216-T-28	299-W14-13		B8549	"42,064.8 "	"75,430.9"	136282.4	566901.7	4	262.0	79.9	8/31/98	XXX	
216-T-28	299-W14-14		B8547	"41,732.4 "	"75,442.7"	136181.0	566898.4	4	443.0	135.0	11/13/98	XXX	
216-T-19	299-W14-51	241-TXSW-2	A7335	"41,144.0 "	"75,587.0"	136001.6	566854.9	8	77.0	23.5	12/31/48		"Deepened 1/83, 6"" Casing, Grouted"
216-T-19	299-W14-52	241-TXSW-4	A7336	"40,934.0 "	"75,587.0"	135937.6	566855.0	8	27.0	8.2	12/31/48		

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
216-T-27	299-W14-53	241-TY-6 241-TY-2 CRIB	A7337	"42,339.9 "	"75,329.8"	136366.3	566932.3	8	100.0	30.5	5/17/55		"Deepened 2/83, 6'" Casing, Grouted"
216-T-19	299-W14-59		A7343	"41,046.0 "	"75,300.0"	135972.0	566942.4	6	18.0	5.5	11/30/81		
216-T-19	299-W14-60		A7344	"41,046.0 "	"75,400.0"	135971.9	566911.9	6	18.0	5.5	11/30/81		
216-T-19	299-W14-61		A7345	"40,946.0 "	"75,400.0"	135941.4	566912.0	6	18.0	5.5	11/30/81		
216-T-27	299-W14-62		A7346	"42,365.6 "	"75,300.4"	136374.1	566941.3	8	68.0	20.7	2/28/83		
216-T-20	299-W14-63		A7347	"41,090.0 "	"74,725.0"	135985.8	567117.6	6	29.0	8.8	4/30/82		
216-Z-5	299-W15-1	231-2	A7348	"40,962.0 "	"76,576.0"	135945.4	566553.6	8	300.0	91.4	5/31/47	XXX	
216-T-19	299-W15-4	241-TX-12	A4929	"41,200.0 "	"75,700.0"	136018.6	566820.4	8	217.0	66.1	1/31/56	XXX	
216-Z-7	299-W15-7		A5476	"40,880.0 "	"76,180.0"	135920.7	566674.3	8	350.0	106.7	3/31/66	XXX	
216-Z-16	299-W15-10		A4916	"41,080.0 "	"76,920.0"	135981.1	566448.7	8	300.0	91.4	1/31/68	XXX	Gas Encountered While Drilling
216-Z-16	299-W15-11		A5474	"41,145.0 "	"77,040.0"	136000.8	566412.0	8	300.0	91.4	3/31/68	XXX	
214-TY FARM	299-W15-12		A4917	"42,350.0 "	"76,095.0"	136368.8	566699.1	6	225.0	68.6	10/31/73	XXX	
216-T-27	299-W15-13		A4918	"42,351.2 "	"75,614.8"	136369.5	566845.5		225.0	68.6	9/5/73	XXX	
214-TX FARM	299-W15-22		A4925	"41,504.0 "	"76,150.0"	136110.9	566683.0	4	221.9	67.6	1/31/91	XXX	
216-Z-16	299-W15-25		A9831	"41,030.5 "	"76,920.6"	135966.0	566448.5			0.0		XXX	

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East	in.	ft	m			
231-Z	299-W15-31A		B2471	"40,670.5"	"77,155.8"	135856.1	566377.1	8	252.4	76.9	9/25/95	XXX	New RCRA Well
216-Z-16	299-W15-33		B2643	"41,032.9"	"76,970.5"	135966.7	566433.3	8	264.9	80.7	6/10/96	XXX	New RCRA Well
216-Z-5	299-W15-34		B2748	"41,010.9"	"76,379.6"	135960.4	566613.4	8	260.6	79.4	6/10/96	XXX	New RCRA Well
216-Z-7	299-W15-35		B2749	"40,657.5"	"75,967.5"	135853.1	566739.3	8	256.2	78.1	6/10/96	XXX	New RCRA Well
241-TX-FARM	299-W15-40		B8550	"41,812.9"	"76,249.3"	136205.0	566652.5	4	262.4	80.0	9/9/98	XXX	
216-Z-10	299-W15-51	231-W-150	A7352	"40,804.0"	"76,535.0"	135897.3	566566.2	6	151.0	46.0	9/30/44		Reverse Well
216-Z-5	299-W15-52	231-1	A7353	"40,920.0"	"76,648.0"	135932.5	566531.7	8	194.0	59.1	4/30/47		
216-Z-5	299-W15-53	231-3	A7354	"40,878.0"	"76,576.0"	135919.8	566553.7	8	80.0	24.4	4/30/47		
216-Z-5	299-W15-54	231-4	A7355	"40,920.0"	"76,628.0"	135932.6	566537.8	8	138.0	42.1	4/30/47		
216-Z-5	299-W15-55	231-5	A7356	"40,904.0"	"76,591.0"	135927.7	566549.1	8	150.0	45.7	4/30/47		
216-Z-5	299-W15-56	231-6	A7357	"40,920.0"	"76,618.0"	135932.6	566540.8	8	150.0	45.7	4/30/47		
216-Z-5	299-W15-57	231-7	A7358	"40,936.0"	"76,591.0"	135937.5	566549.0	8	155.0	47.2	5/31/47		
216-Z-5	299-W15-58	231-8	A7359	"40,920.0"	"76,678.0"	135932.5	566522.5	8	124.0	37.8	5/31/47		
216-Z-6	299-W15-59	231-11	A7360	"40,811.0"	"76,522.0"	135899.4	566570.2	8	175.0	53.3	9/30/47		
216-Z-6	299-W15-60	231-9	A7361	"40,788.0"	"76,535.0"	135892.4	566566.2	8	175.0	53.3	9/30/47		

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
216-Z-6	299-W15-61	231-10	A7362	"40,811.0 "	"76,548.0"	135899.4	566562.2	8	175.0	53.3	9/30/47		
216-Z-7	299-W15-62	241-TX-231-1	A7363	"40,975.0 "	"76,150.0"	135949.7	566683.4	8	200.0	61.0	10/31/47		"Deepened 12/82, 6"" Casing, Grouted"
216-Z-7	299-W15-63	241-TX-231-2	A7364	"40,975.0 "	"76,100.0"	135949.7	566698.6	8	200.0	61.0	10/31/47		"Deepened 11/82, 6"" Casing, Grouted"
216-Z-7	299-W15-64	241-TX-231-3	A7365	"40,900.0 "	"75,965.0"	135927.0	566739.8	8	200.0	61.0	10/31/47		"Deepened 11/82, 6"" Casing, Grouted"
216-T-19	299-W15-65	241-TXSW-1	A7366	"41,144.0 "	"75,629.0"	136001.6	566842.1	8	26.0	7.9	12/31/48		
216-T-19	299-W15-66	241-TXSW-3	A7367	"40,934.0 "	"75,629.0"	135937.6	566842.2	8	77.0	23.5	12/31/48		"Deepened 1/83, 6"" Casing, Grouted"
216-Z-7	299-W15-76	231-12	A7377	"40,878.0 "	"76,229.0"	135920.1	566659.4	8	102.0	31.1	7/31/51		
216-Z-7	299-W15-77	231-13	A7378	"40,824.0 "	"76,170.0"	135903.7	566677.4	8	72.0	21.9	7/31/51		
216-Z-7	299-W15-78	231-14	A7379	"40,824.0 "	"76,100.0"	135903.7	566698.8	8	73.0	22.3	7/31/51		
216-T-21	299-W15-80	241-TX-10	A7381	"41,495.0 "	"76,570.0"	136107.8	566555.0	8	120.0	36.6	10/31/53		"Deepened 11/82, 6"" Casing, Grouted"
216-T-22	299-W15-81	241-TX-11	A7382	"41,640.0 "	"76,745.0"	136151.9	566501.6	8	115.0	35.1	10/31/53		
216-Z-17	299-W15-204		A7502	"40,673.0 "	"76,373.0"	135857.5	566615.7	6	20.0	6.1	3/31/81		
216-T-22	299-W15-209		A7507	"41,600.0 "	"76,600.0"	136139.8	566545.8	8	50.0	15.2	11/30/82		
216-T-23	299-W15-210		A7508	"41,730.0 "	"76,590.0"	136179.4	566548.7	8	100.0	30.5	10/31/82		
216-T-24	299-W15-211		A7509	"41,820.0 "	"76,475.0"	136207.0	566583.7	8	100.0	30.5	10/31/82		

TEST WELLS SURROUNDING T, TX, & TY TANK FARMS

WELL IDENTIFICATION				COORDINATES				WELL				COMMENTS	
Well Vicinity	Site	Previous	Wa. State #	Hanford (ft)		Lambert (m)		Dia. in.	Depth		Date Installed	Used for Site GW Monitoring	From Hanford Well Report
				North	West	North	East		ft	m			
216-T-25	299-W15-212		A7510	"41,846.0"	"76,600.0"	136214.8	566546.1	8	100.0	30.5	10/31/82		
270ZD	299-W15-214		A7512	"40,000.0"	"76,252.0"	135652.5	566653.1	8	13.0	4.0	7/31/85		

APPENDIX K

LISTING OF OCCURRENCE REPORTS FOR

T, TX, AND TY TANK FARMS

(1973-1970)

OCCURANCES IN T, TX, & TY TANK FARMS 1973 - 1980
(ONLY OCCURRENCE RELATED TO WASTE ANOMALIES ARE LISTED)

REPORT No.	DATE	DESCRIPTION	Associated UPR
73-45	7/5/73	Broken Transfer Pipe Flange Near T-106	
74-108	6/7/74	Symptoms of Leakage from Liquid Level Drop and Dry Well Activity in/near Tank T-109	
75-02	1/6/75	Increased Dry Well Radiation Levels Adjacent to Tanks T-105 & T-108	
75-17	2/18/75	Decreasing Liquid Level in Tank T-101	
75-51	4/18/75	Decreasing Liquid Level in Tank T-108	
75-147	12/30/75	Dry Well Radiation Peak Growth, Well 50-01-06	
76-56	4/9/76	Dry Well Radiation Increase, Well 50-08-09	
76-60	4/20/76	Dry Well Radiation Increase, Well 50-07-03	
76-71	5/10/76	Liquid Level Increase Tank T-203	
76-76	5/22/76	Liquid Level Increase Tank T-204	
76-175	12/28/76	Dry Well Radiation Increase, Well 50-05-07	
76-176	12/28/76	Dry Well Radiation Increase, Well 50-01-06	
77-186	10/18/77	Liquid Level Increase Tank T-108	
77-196	11/8/77	Dry Well Radiation Peak Increase, Well 50-05-06	
77-201	11/18/77	Liquid Level Decrease Tank T-112	
77-210	12/20/77	Liquid Level Decrease Tank T-203	
78-60	6/9/78	Dry Well Radiation Increase, Well 50-08-07	
79-75	8/29/79	Dry Well Radiation Increase, Well 50-08-08	
80-53	6/7/80	Liquid Level Increase, Tank T-201	

TX-TANK FARM

74-23	4/3/74	Significant Liquid Level Decrease, Tank TX-110	
74-28	4/10/74	Significant Liquid Level Decrease, Tank TX-102	

OCCURANCES IN T, TX, & TY TANK FARMS 1973 - 1980
(ONLY OCCURRENCE RELATED TO WASTE ANOMALIES ARE LISTED)

REPORT No.	DATE	DESCRIPTION	Associated UPR
74-129	9/4/74	Dry Well Radiation Increase Between Tanks TX-113 & 114	
74-152	12/5/74	Decreasing Liquid Level Tank TX-112	
75-44	4/8/75	Decreasing Liquid Level Tank TX-104	
75-57	4/25/75	Decreasing Liquid Level Tank TX-107	
75-64	6/7/75	Decreasing Liquid Level Tank TX-106	
75-101	8/9/75	Liquid Level Drop in Tank TX-107	
75-146	12/26/75	Liquid Level Decrease Tank TX-114	
76-06	1/17/76	Liquid Level Decrease Tank TX-106	
76-21	2/18/76	Uncontrolled Release of Water at 241-TX-155 Diversion Box	
76-23	2/17/76	Liquid Level Decrease, Diversion Box 155-TX Catch Tank TX-302-B	
76-38	3/26/76	Liquid Level Decrease Tank TX-108	
76-47	4/7/76	Reuse of Tank TX-115 after Removed form Service	
76-50	4/19/76	Liquid Level Increase Tank TX-114	
76-53	4/14/76	Liquid Level Increase Tank TX-102	
76-61	4/25/76	Accidental Discharge of Water to Soil Over and Between Tanks TX-104 & 108	
76-66	5/5/76	Liquid Level Increase Tank TX-106	
76-87	6/13/76	Liquid Level Increase Tank TX-111	
76-97	7/8/76	Liquid Level Increase Tank TX-106	
76-99	7/8/76	Liquid Level Increase Tank TX-115	
76-101	7/16/76	Liquid Level Increase Tank TX-114	
76-102	7/20/76	Liquid Level Decrease Tank TX-109	
76-103	7/20/76	Liquid Level Decrease Tank TX-104	

OCCURANCES IN T, TX, & TY TANK FARMS 1973 - 1980
(ONLY OCCURRENCE RELATED TO WASTE ANOMALIES ARE LISTED)

REPORT No.	DATE	DESCRIPTION	Associated UPR
TX-TANK FARM CONTINUED			
76-137	10/6/76	Liquid Level Decrease Tank TX-108	
76-156	11/12/76	Liquid Level Increase Tank TX-115	
76-164	12/3/76	Dry Well Radiation Increase, Well 51-14-04	
77-01	1/6/77	Liquid Level Decrease 001-TXR-Sump	
77-05	1/10/77	Liquid Level Decrease Tank TX-104	
77-06	1/14/77	Dry Well Radiation Increase, Well 51-14-04	
77-18	1/27/77	Liquid Level Increase Tank TX-115 (Broken water valve in flush pit).	
77-20	2/1/77	Liquid Level Decrease Tank TX-107	UPR-200-W-149
77-55	4/22/77	Liquid Level Decrease Tank TX-107	UPR-200-W-149
77-65	4/29/77	Liquid Level Decrease in Catch Tank TX-302A	
77-70	5/11/77	Liquid Level Increase Tank TX-108	
77-87	6/6/77	Liquid Level Increase 002-TXR-Sump	
77-103	6/24/77	Dry Well Radiation Increase, Well 51-07-06, 51-07-18, 51-03-12, 51-03-11, 51-03-01	UPR-200-W-149
77-107	6/30/77	Liquid Level Decrease Tank TX-102	
77-109	7/5/77	Liquid Level Decrease Tank TX-105	
77-115	7/6/77	Liquid Level Decrease Tank TX-107	UPR-200-W-149
77-137	8/8/77	Misrouting of Process Solution to Tank TX-109	
77-138	8/13/77	Liquid Level Increase Tank TX-114	
77-144	8/18/77	Dry Well Radiation Increase, Well 51-10-01	
77-150	8/30/77	Liquid Level Decrease Tank TX-105	

OCCURANCES IN T, TX, & TY TANK FARMS 1973 - 1980
(ONLY OCCURRENCE RELATED TO WASTE ANOMALIES ARE LISTED)

REPORT No.	DATE	DESCRIPTION	Associated UPR
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TX-TANK FARM CONTINUED

77-155	9/8/77	Exceeding Maximum Operating Limit 002-TXR-Tank	
77-158	9/12/77	Exceeding Maximum Operating Limit 002-TXR-Sump	
77-160	9/14/77	Exceeding Maximum Operating Limit Tank TX-114	
77-169	9/23/77	Liquid Level Decrease Tank TX-115	
77-182	10/12/77	Liquid Level Decrease Tank TX-105	
77-199	11/12/77	Liquid Level Decrease Tank TX-104	
77-208	12/10/77	Liquid Level Decrease Tank TX-106	
77-212	12/23/77	Liquid Level Decrease Tank TX-103	
78-06	1/10/78	Backflow of Contamination into Raw Water System TX Tank Farm	
78-76	7/26/78	Water Line Break Near TX-Farm, along Camden ST.	
78-129	12/4/78	Liquid Level Decrease Catch Tank TX-302A	
79-22	2/8/79	Dry Well Radiation Increase, Well 51-07-07	
79-29	1/31/79	Contaminated Vapor Venting from Tank TX-118	
79-31	3/21/79	Liquid Level Decrease Tank TX-110	
79-68	7/11/79	Liquid Level Decrease 001-TXR-Tank	
80-60	5/8/80	Liquid Level Increase Catch Tank TX-302-C	
80-64	7/11/80	Liquid Level Increase Tank TX-112	
80-73	7/10/80	Misrouting of waste from 241-TX-118 into 241-TX-103	

TY-TANK FARM

74-88	6/13/74	Dry Well Radiation Increase, Well 52-06-05 at TY-106	
74-101	6/25/74	Dry Well Radiation Increase, at Tank TY-103	(UPR-200-W-150)

OCCURANCES IN T, TX, & TY TANK FARMS 1973 - 1980
(ONLY OCCURRENCE RELATED TO WASTE ANOMALIES ARE LISTED)

REPORT No.	DATE	DESCRIPTION	Associated UPR
74-102	6/26/74	Dry Well Radiation Increase, at Tank TY-105	
76-22	2/17/76	Liquid Level Increase Tank TY-103	
77-116	7/9/77	Liquid Level Decrease Tank TY-102	
77-148	8/25/77	Liquid Level Increase Tank TY-101	

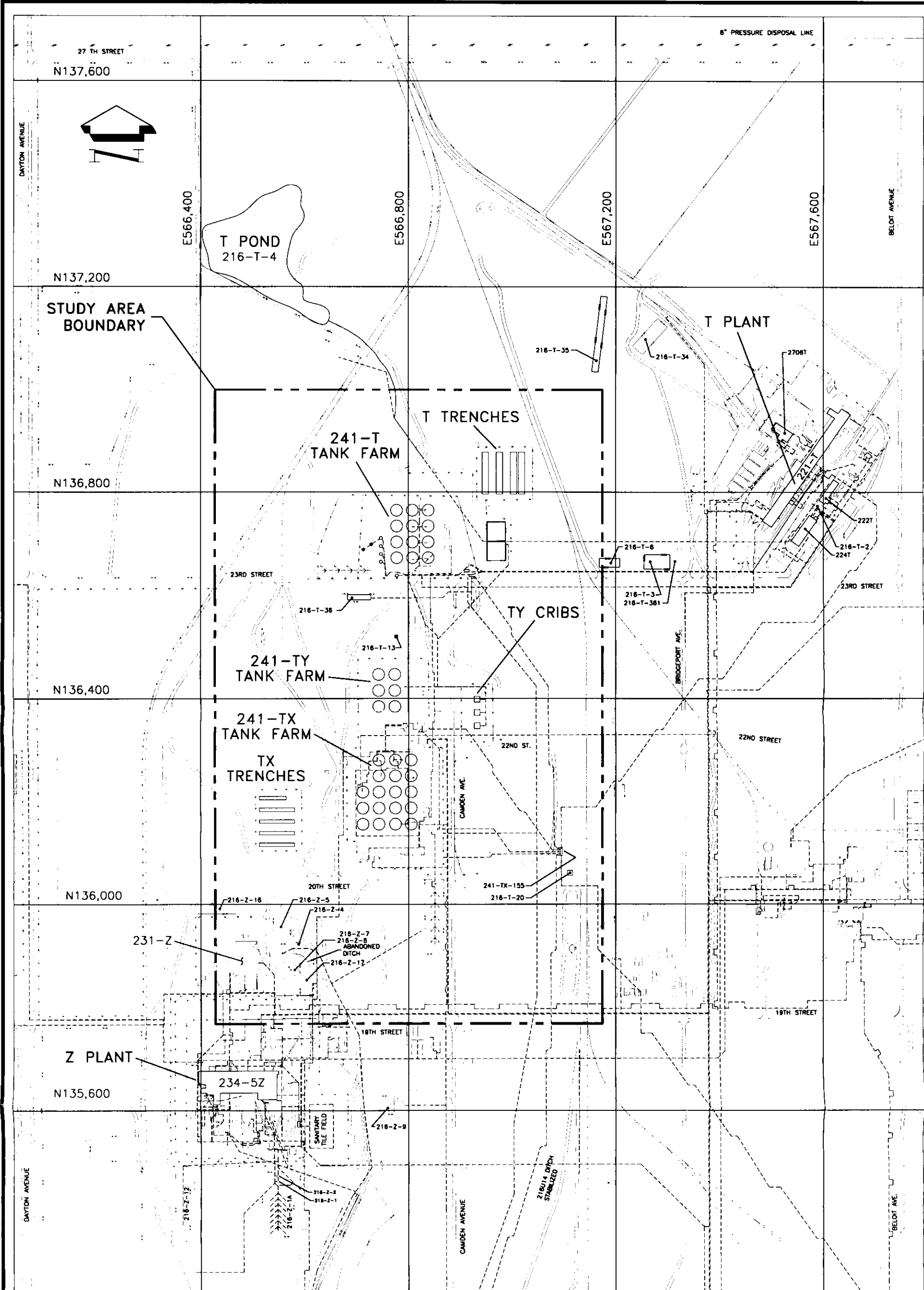
242-T EVAPORATOR

75-140	12/1/75	Leakage from Gang Valve on Roof of 242-T Spread Contamination to Surrounding Area.
76-27	3/1/76	Leaking Flange Connection Caused Spill into Evaporator Feed Cell and Contamination Seeped Through Cracks in Cell Walls

APPENDIX L

FIGURES

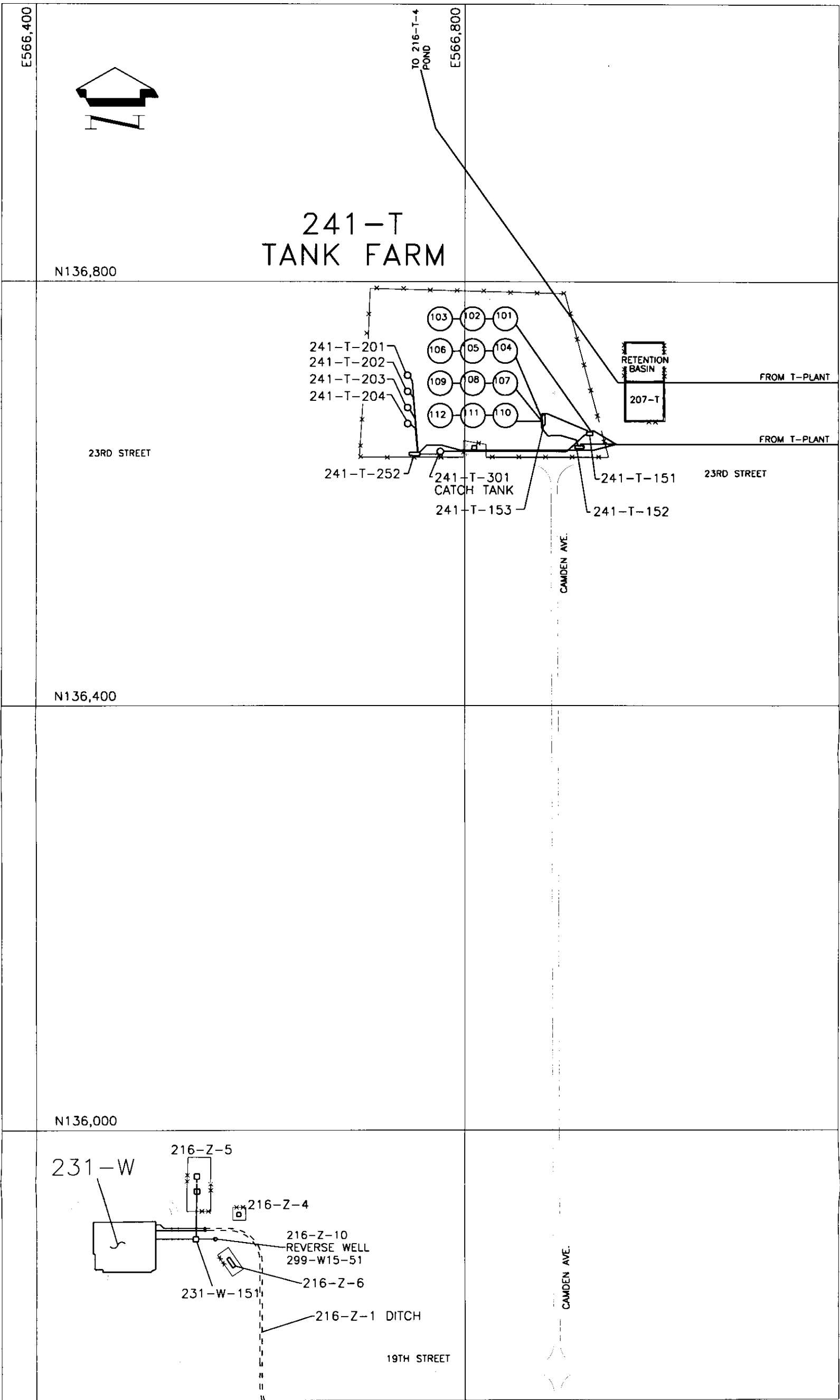
- Figure 1: T, TX, and TY Tank Farms 200 West Area
- Figure 2: The Manhattan Project Facilities, (1943-1945)
- Figure 2a: Test Wells Constructed for the Manhattan Project
- Figure 3: Postwar Bismuth Phosphate Operations and Waste Disposal Facilities, (1946-1956)
- Figure 3a: Test Wells Constructed for Postwar Bismuth Phosphate Operations and Waste Disposal
- Figure 4: Uranium Recovery Operations Facilities, (1952-1958)
- Figure 4a: Test Wells Constructed for Uranium Recovery Operation
- Figure 5: Central Decontamination and In-Tank Solidification Operation Facilities, (1960-1974)
- Figure 5a: Test Wells Constructed for Central Decontamination and In-Tank Solidification Operations
- Figure 6: Stabilization and Isolation Facilities, (1975-Present)
- Figure 6a: Test Wells Constructed for Stabilization and Isolation



T, TX, & TY TANK FARMS
200 WEST AREA
FIGURE 1

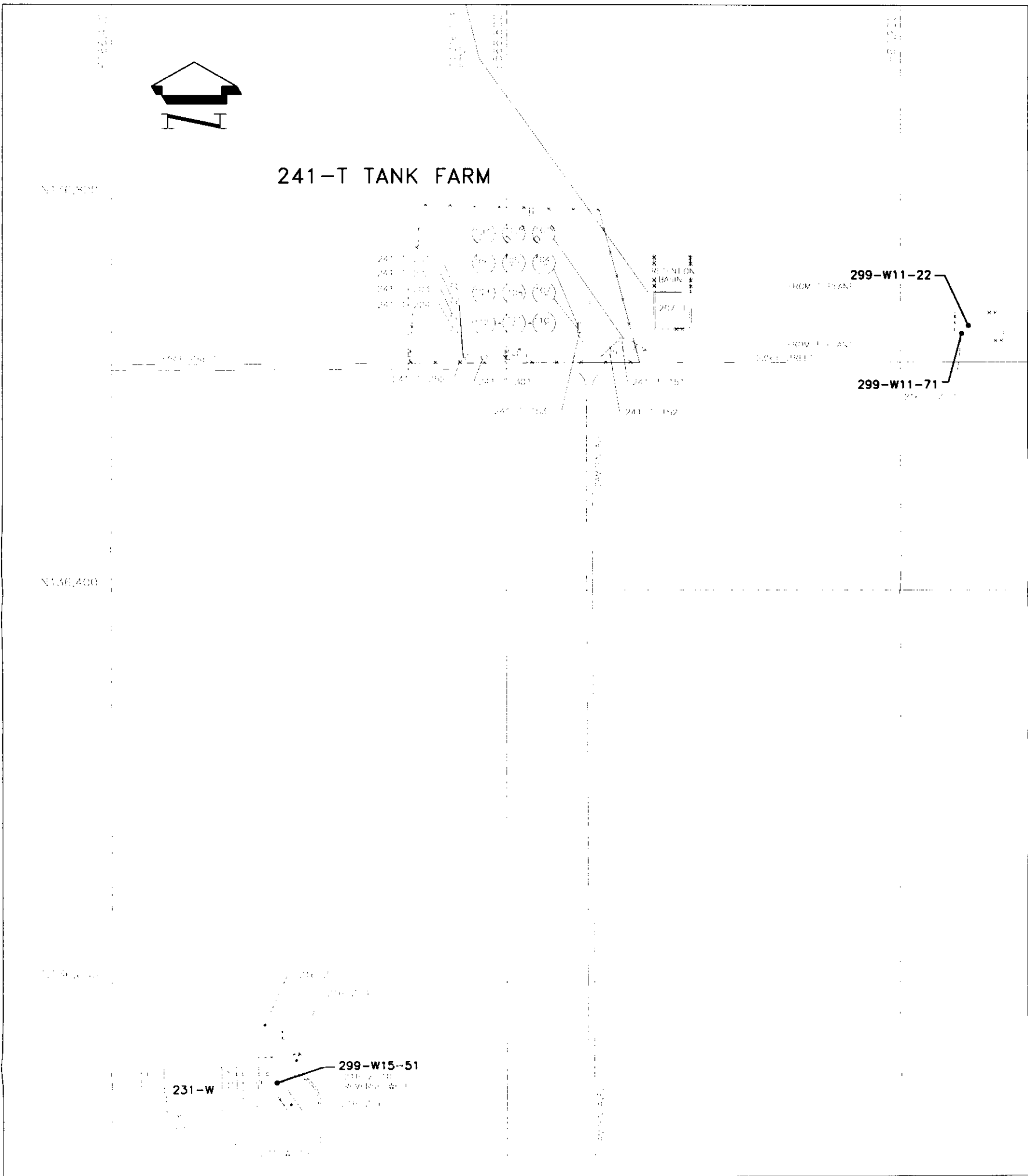
LEGEND

- EXISTING FACILITIES
- EXISTING PIPE LINES
- FENCE



THE MANHATTAN PROJECT FACILITIES
(1943-1945)
FIGURE 2

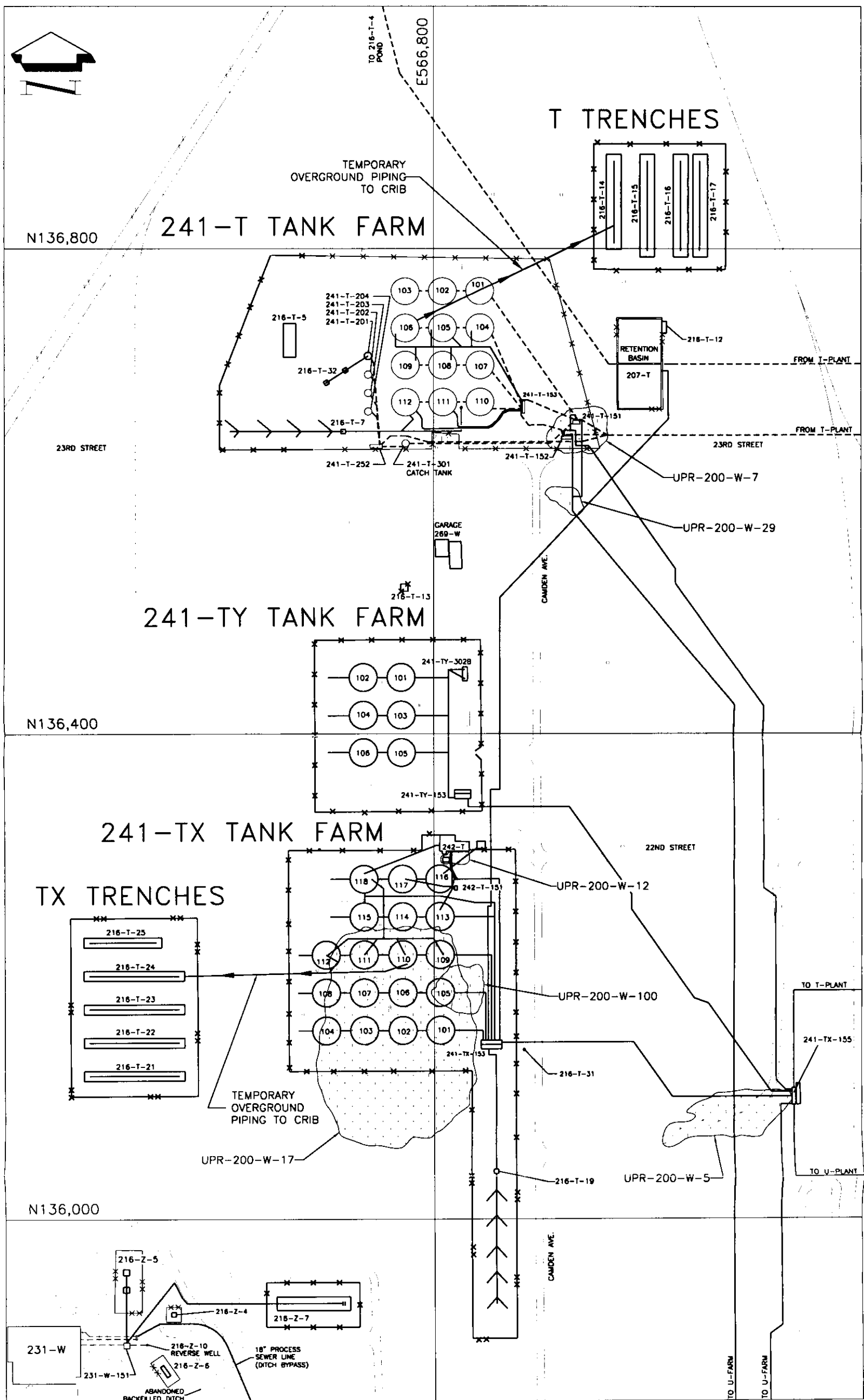
LEGEND
 — NEW FACILITIES
 --* FENCE
 = = = = DITCH



LEGEND

NEW WELLS ARE SHOWN IN "BOLD" TEXT.

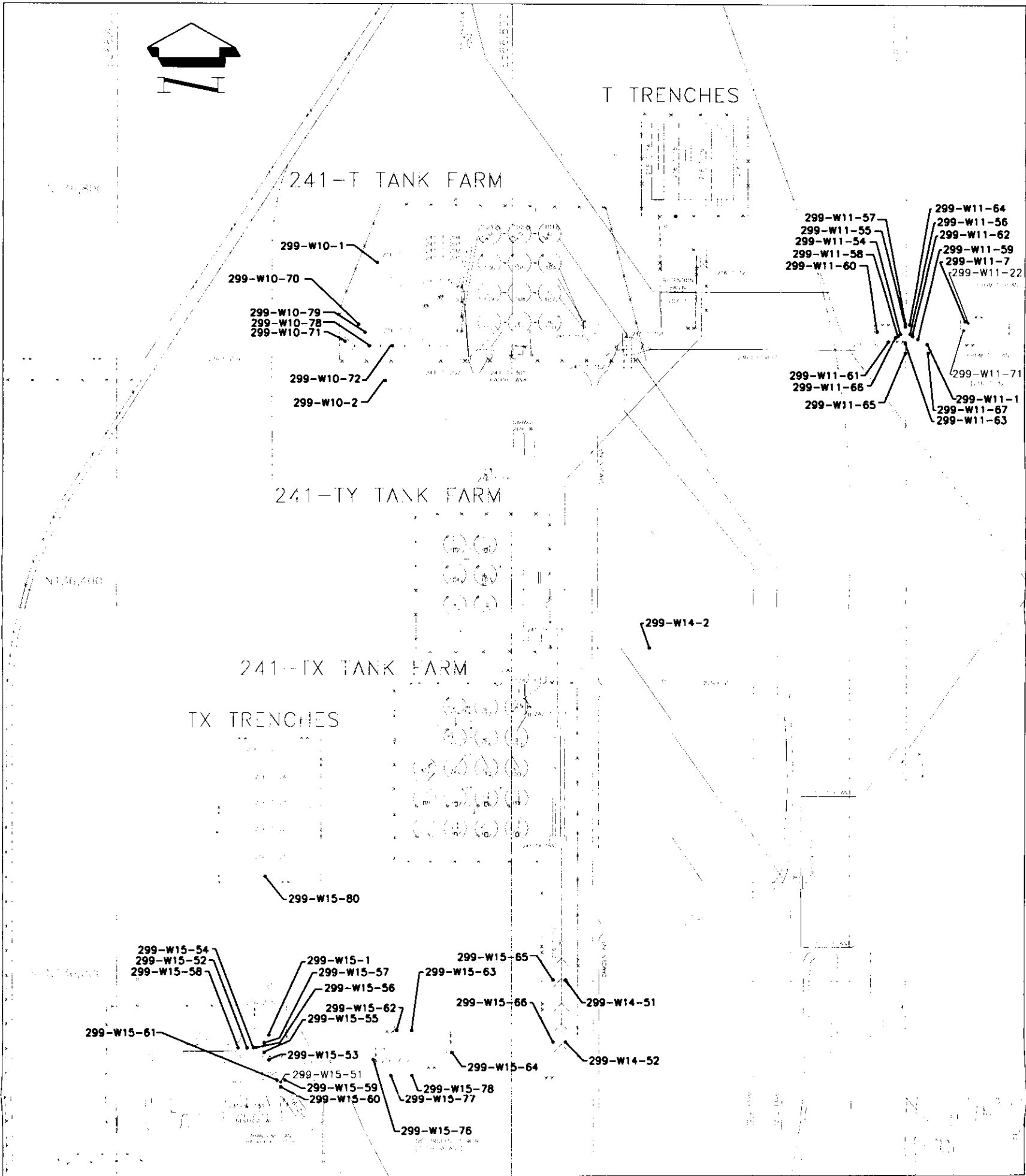
TESTWELLS CONSTRUCTED FOR THE MANHATTAN PROJECT
(1943-1945)
FIGURE 2a



POSTWAR BISMUTH PHOSPHATE OPERATIONS
AND WASTE DISPOSAL FACILITIES
(1946 - 1956)
FIGURE 3

LEGEND

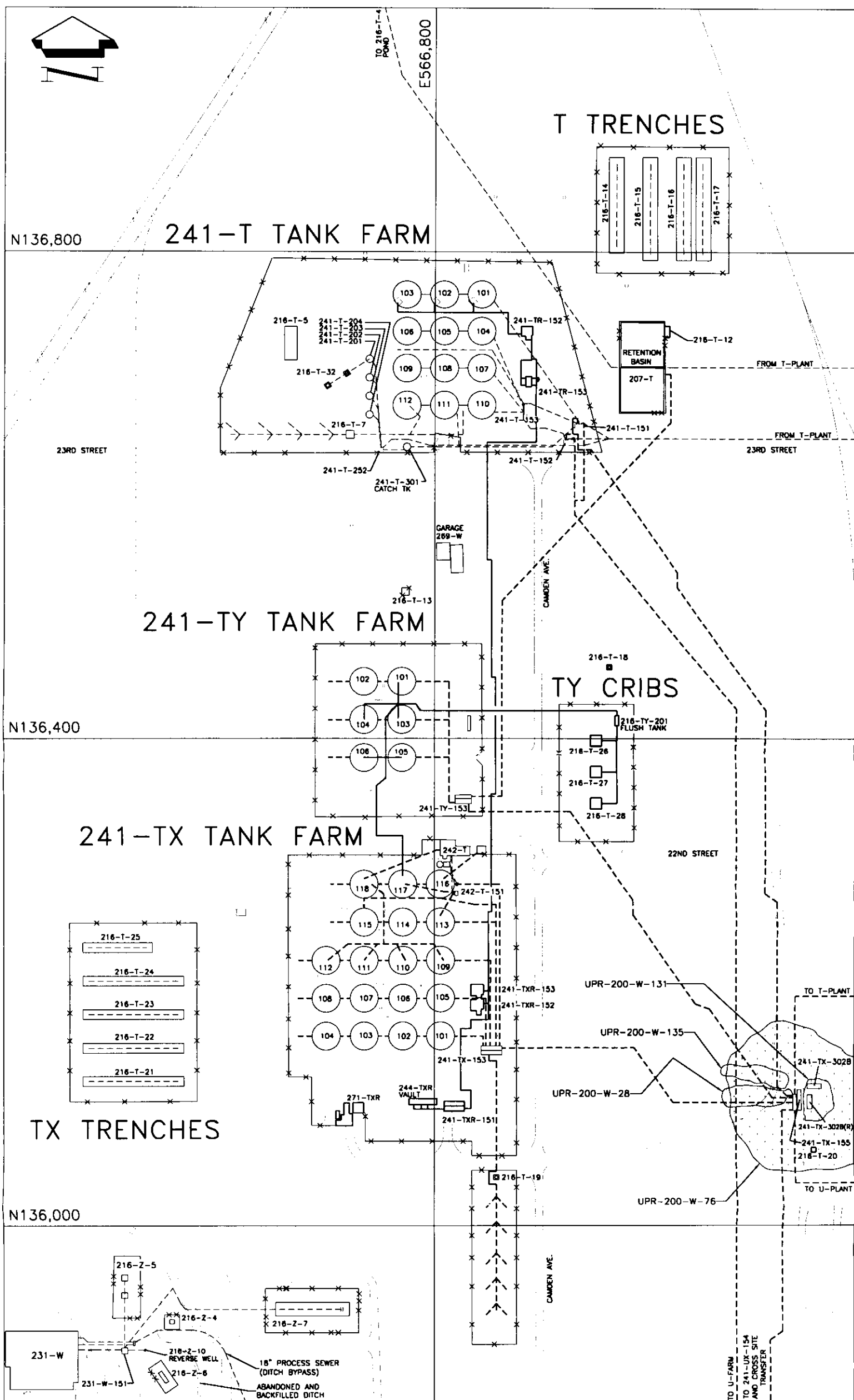
- NEW FACILITIES
- - - ACTIVE EXISTING PIPELINES
- EXISTING FACILITIES
- FENCE
- UNPLANNED RELEASE (UPR)



LEGEND

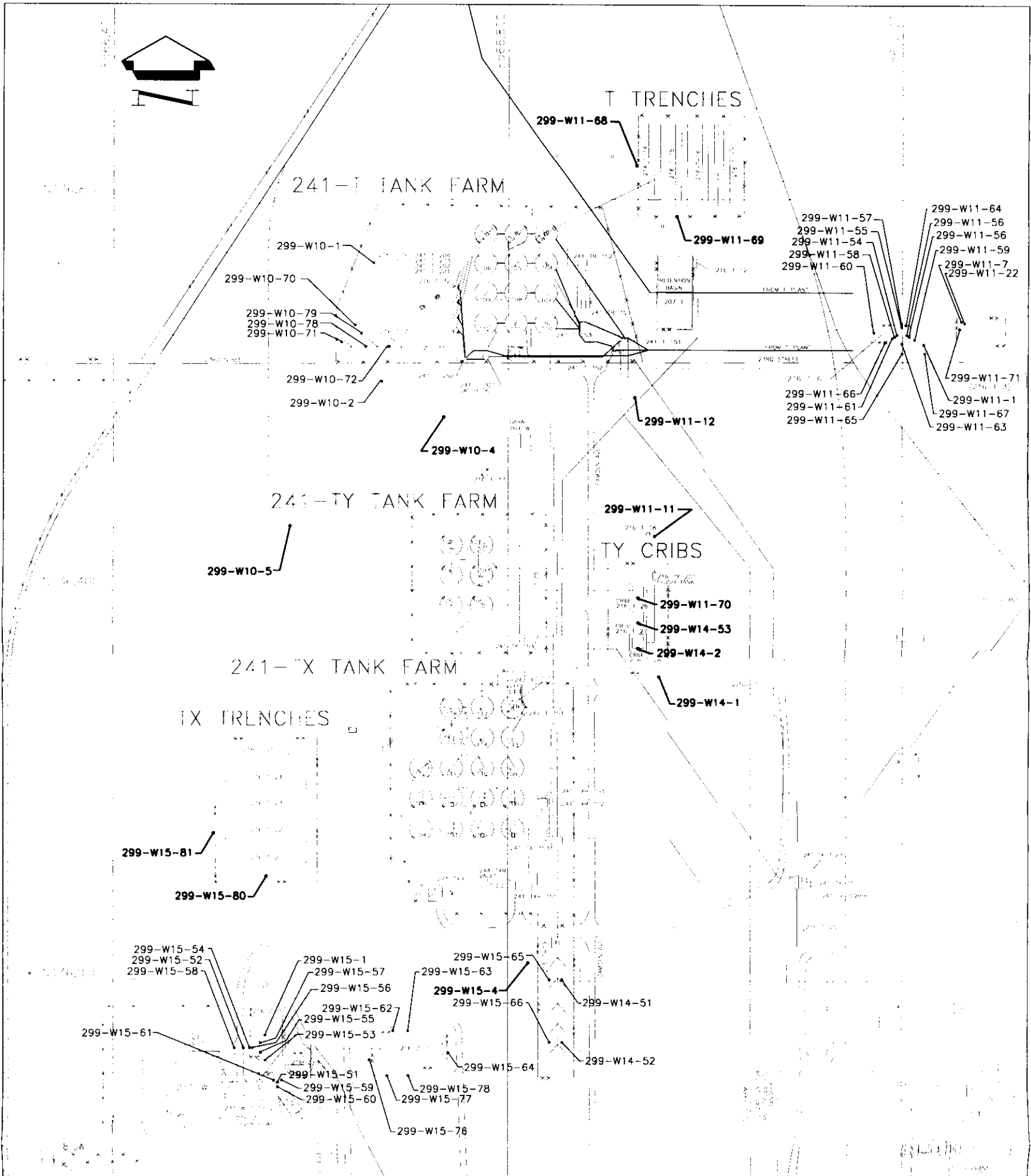
NEW WELLS ARE SHOWN IN "BOLD" TEXT.

TESTWELLS CONSTRUCTED FOR POSTWAR BUSMUTH
PHOSPHATE OPERATIONS AND WASTE DISPOSAL
(1946-1956)
FIGURE 3a



URANIUM RECOVERY OPERATIONS FACILITIES
(1952-1958)
FIGURE 4

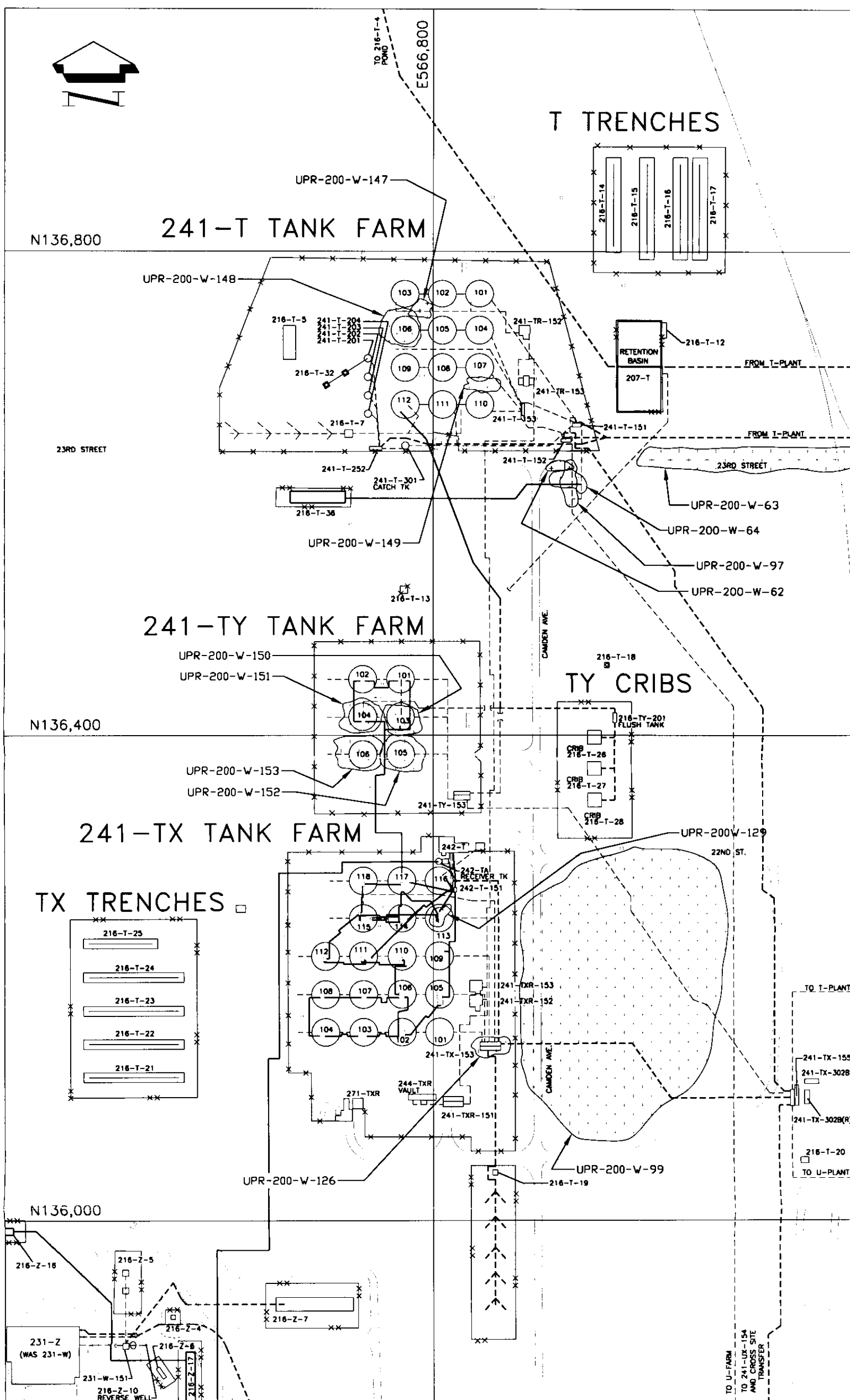
- LEGEND**
- NEW FACILITIES
 - - - ACTIVE EXISTING PIPE LINES
 - - - EXISTING PIPE LINES
 - - - EXISTING FACILITIES
 - x x x x FENCE
 - UNPLANNED RELEASE (UPR)



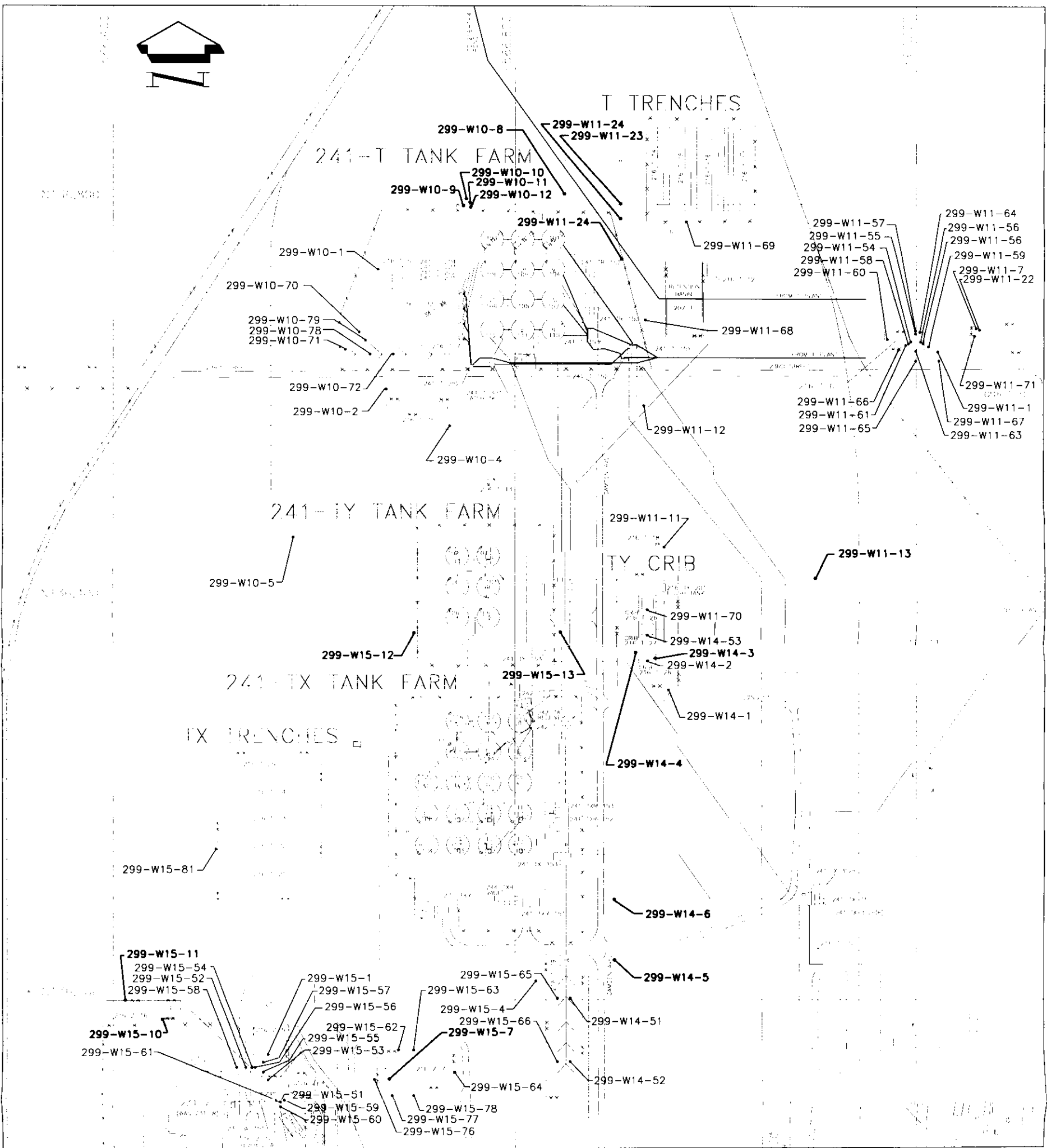
LEGEND

NEW WELLS ARE SHOWN IN "BOLD" TEXT

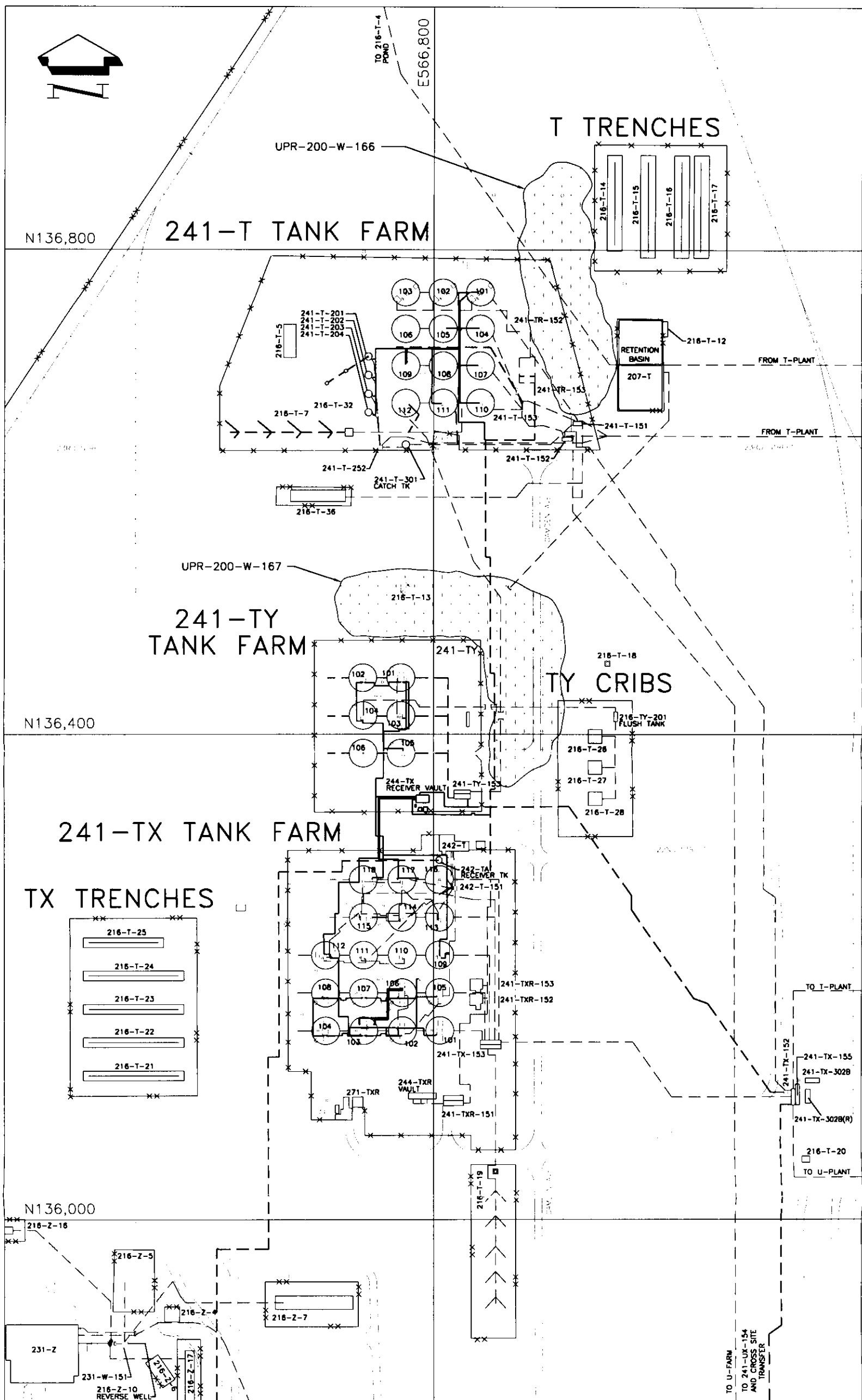
TESTWELLS CONSTRUCTED FOR URANIUM RECOVERY OPERATIONS
(1952-1958)
FIGURE 4a



CENTRAL DECONTAMINATION AND
IN-TANK SOLIDIFICATION OPERATION FACILITIES
(1960 - 1974)
FIGURE 5



TESTWELLS CONSTRUCTED FOR CENTRAL DECONTAMINATION
AND IN-TANK SOLIDIFICATION OPERATION
(1960-1974)
FIGURE 5a



STABLIZATION AND ISOLATION FACILITIES
(1975 TO PRESENT)
FIGURE 6

- LEGEND**
- NEW FACILITIES
 - - - ACTIVE EXISTING PIPE LINES
 - - - EXISTING PIPE LINES
 - - - EXISTING FACILITIES
 - x x x x x FENCE

